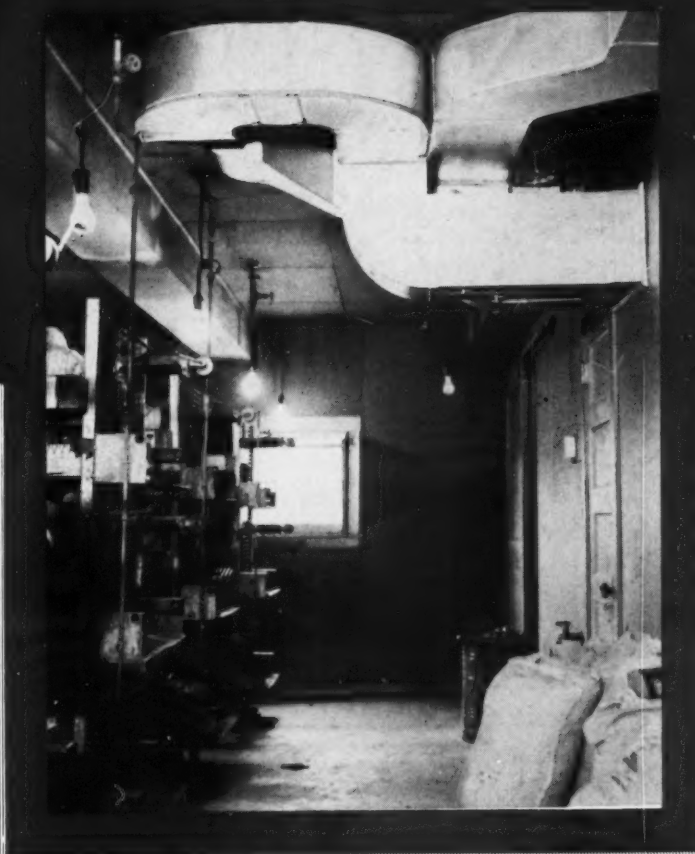


AMERICAN ARTISAN

AUGUST
1940



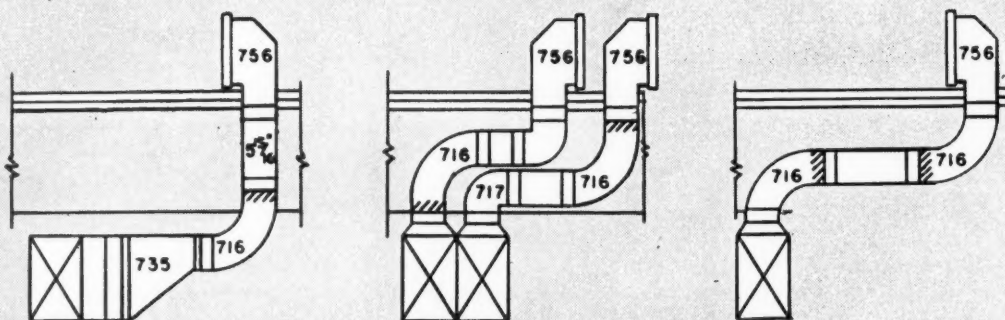
RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1880

LAMNECK No. 716

3" Radius Throat STACK ELBOW

STACK LENGTHS AND FITTINGS BELOW FLOOR
FOR RECTANGULAR BRANCHES



NOTE SHADED AREAS INDICATE LONGER LEG OF NO. 716 ELBOW

SIDE TAKEOFF
BELOW JOIST

2-TOP TAKEOFF
BRANCHES CONCEALED

TOP TAKEOFF
BRANCH

CUTS DOWN RESISTANCE!

Airflow through branches using LAMNECK No. 716 Stack Elbows encounters less resistance per foot of travel because of the 3" inside throat radius. By actual measurement the 3" radius throat elbow has a resistance equal to 5 feet of straight pipe, as compared to 27 feet for a square throat elbow. Figured on a basis of blower capacity, this means maximum *planned* air delivery.

From your standpoint, as well as the customer's, it means *less cost* because more air can be delivered to a given point with a smaller stack, utilizing the maximum efficiency of the blower.

Strictly from the installation and planning viewpoint, you'll notice the *practical* advan-

tage of making one leg of the elbow longer than the other. This feature offers you further savings through *simplification* by eliminating cutting and adjusting.

INTERCHANGEABLE! Permits Wide Adjustment Range!

Like *all* LAMNECK Prefabricates, practical application and installation features dominate PRE-ENGINEERED efficiency. No. 716 elbow, because of the varying adjustments possible, speeds installations, saves money! You gain an outstanding opportunity to do a better job—faster—at less cost—and *with more profit to you!* We recommend using this stack elbow wherever construction permits.

Specify

NOTE OUR
NEW
ADDRESS

After you write for the name of your nearby distributor, sit down and talk with him. You can rely on his sound advice and judgment.

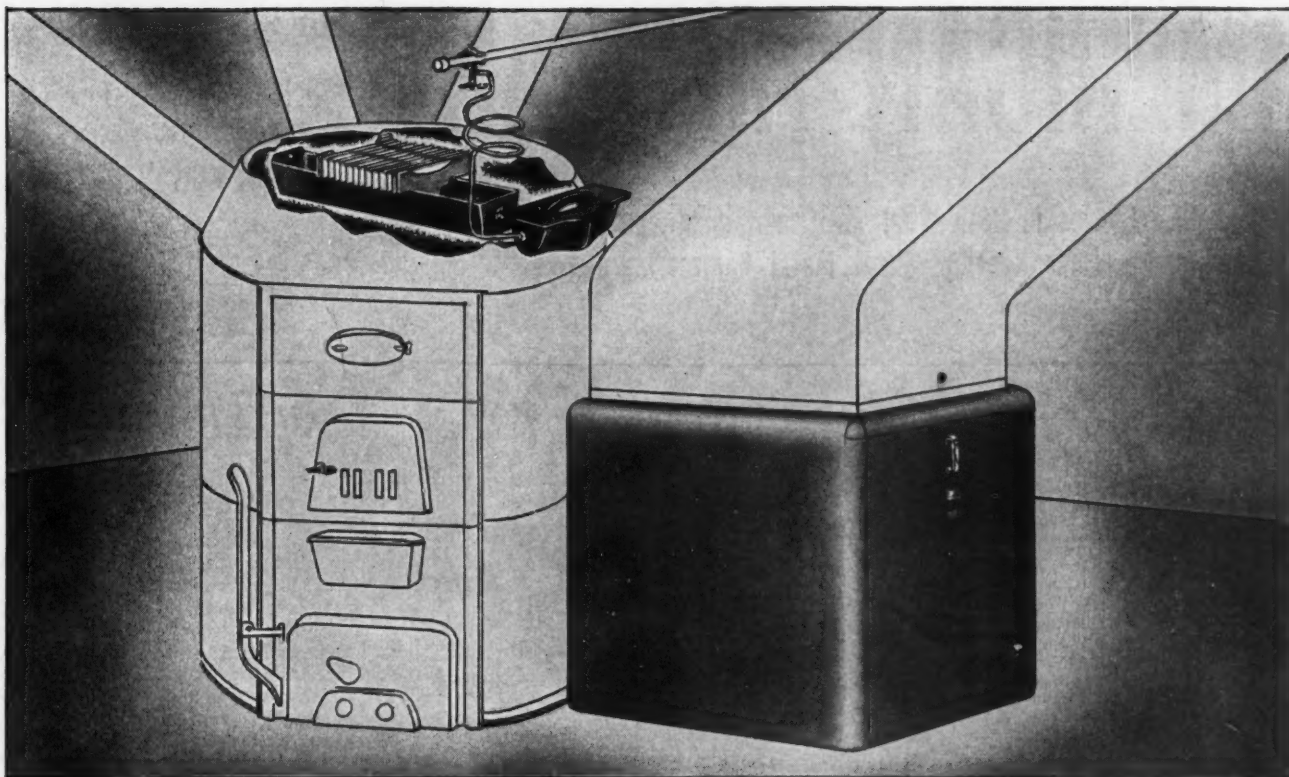
LAMNECK



*Prefabricated Duct and Fittings
for all Types of Residential Warm
Air Heating and Air Conditioning
Systems.*

LAMNECK PRODUCTS, INC.

Middletown, Ohio



WHEN YOU SELL WINTER AIR CONDITIONING *Sell the Whole Job*

Selling winter air conditioning without humidification is like selling cake without frosting. Humidification is the cheapest part of the job, but it adds sales appeal that makes it much easier to get the order because the public has become very humidity-conscious.

The Viking Line of Conditioners and Humidifiers offers you an opportunity to increase your sales volume by cashing in on this profitable merchandising idea.

Each of these units is a splendid example of Viking engineering. The Viking Conditioner is loaded with sales features. It is not only a superlative winter unit, but also an efficient summer circulator.

The Viking Humidifier with the fool-proof top-seat valve and newly-developed Cello-Sponge evaporators is an efficient high-capacity unit that you can be proud to recommend and sell.

Write Today for Complete Information



**FANS.....
BLOWERS...
HUMIDIFIERS**

Viking Air Conditioning Corp.
9490 Richmond Avenue, S. E. Cleveland, Ohio

VIKING AIR CONDITIONING CORPORATION

AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

FURNACES
SHEET METALS

AND

Warm-Air
Heating

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 109, No. 8

August, 1940

Founded 1880

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In This Issue

THIS month's cover photo was taken by J. E. Peterson, Hinsdale, Ill. contractor, whose article on a winter air conditioning system for a poultry house appears on page 52. From correspondence, it seems that commercial poultry raisers and "egg men" are looking to air conditioning to level off peaks in egg and fowl production. Since we can produce practically any practical inside conditions, poultry raisers may offer an active field for large systems.

Two interesting developments in summer cooling, without refrigeration, are reported. On page 56 we report the replacement of attic fans by window fans in New Orleans and on page 57 the high gain in sales of evaporative coolers in San Antonio. We also report some engineering ideas of Cole-Hagood attic fan installations on page 48 and sales ideas of Louisiana-Western Lumber Co. on page 58.

The series on proper installation of copper roofs by Carter Cole reaches the wide gutter problem on page 63. Wide gutters need special handling and what happens when standard practice is sidestepped is pictorially shown.

Ingenuity in developing shop-made dies, jigs, machines for the fabrication of sheet metal specialties is well illustrated in the description of Monday Mfg. Co., Ft. Worth, Texas production of stainless steel tanks. Page 66.

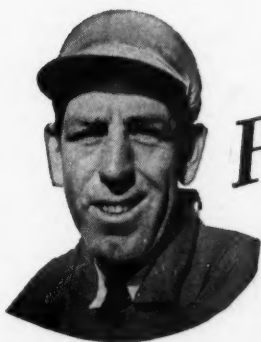
Lawrence Gichner, page 72, submits another of his descriptions of a metal roof failure—this failure caused by poor wood sheathing and no provision for expansion. This is an especially interesting report because of the reconstruction methods adopted to save reconstruction cost and insure future permanence.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

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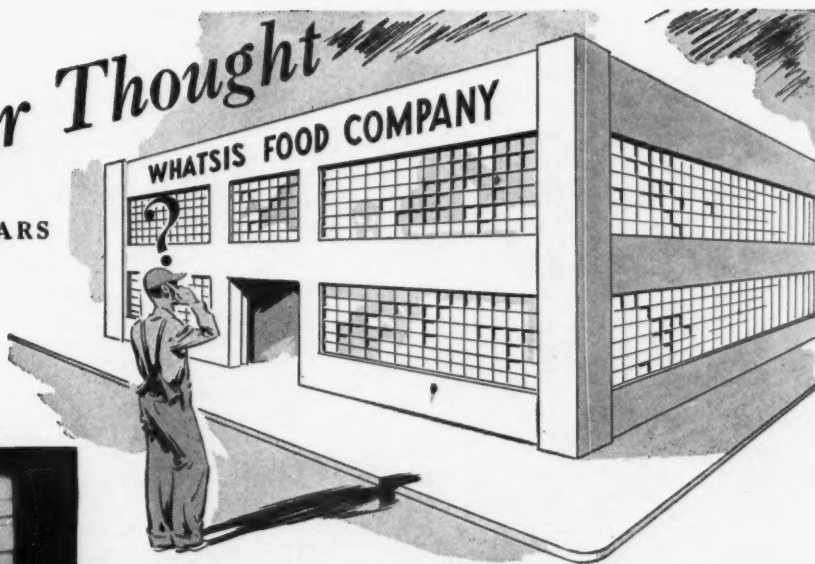
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More than 8,000 copies of this issue are being distributed



Food for Thought

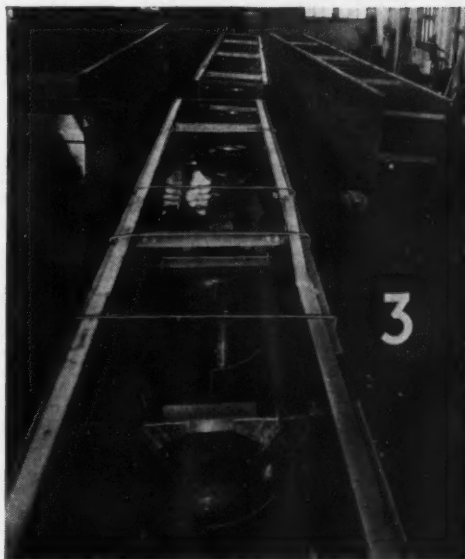
BY TIM SHEARS



1. The way some of these canning plants an' such gobble up sheet metal is food of a different kind than what goes into your stomach. It's the kind that makes a sheet metal man's brains start workin' overtime. The order for this pile of transfer cans, for instance, must have been quite a help for some contractor. They're made out of 16 gauge Monel sheet, electric welded for one of the big soup companies.



2. There's no end to the kind of jobs that's waiting for you to pick up in food plants. An' they're the kind of jobs that mean money for the fabricator. Note this equipment used for makin' maple syrup. Pans, kettles an' all, they're made out of Monel, silver soldered at the joints. A sweet job for the sheet metal man that took the trouble to walk in an' pick up the order!



3. You can always find plenty of jobs, if you know how to handle Monel. One reason is that it's often the only metal a customer can be sure of. This 94 ft. steel trough made up in three sections shows what I mean. It had to be lined with something that would stand up against brine used by the food concern that ordered it. Only answer to that, according to the people who've tried other things, is Monel. So Monel it was...3000 pounds of it!



4. With hot weather bringing a land office business to the soft drink trade, plants in that line ought to be a good bet for you. These tanks are the kind of job they're liable to hand you. An' the metal they want is Monel...because it stays on the job an' doesn't make soft drink syrup change color or taste like something else.

I'm not the kind of guy who won't walk under a ladder or be third on a match. But one thing I think is *unlucky* is passing up a cannery or food plant. Next time you see one don't walk by...stop an' ask yourself what do they use for equipment? It's transfer cans to ladles they use plenty of things that you can make...an' want it made of Monel.

TIM SHEARS

THE INTERNATIONAL NICKEL CO., INC., 67 WALL ST., NEW YORK, N. Y.

What Goes on Here?



Thousands of new homes are being built in America this year—a far greater number will be remodeled or repaired. The sheet metal work on most of these will be well done, but there will always be some jobs where the workmanship and materials are of a quality far below what they should be.

You are tempted at times to sell some of these very cheap sheet metal and heating jobs, just as we are to sell the inferior materials which make them possible. Why don't we both do it? The reason is that the home owner has to pay dearly for such work and he does not forget it. Contrasted with the job that gives the kind of honest value which pleases customers, the former policy may make you or us a temporary profit, but the latter builds a sound business and keeps it growing. Can there be any question which is the better method of operating?

THE J. M. & L. A.
OSBORNE
Manufacturers—Distributors
 BUFFALO • CLEVELAND • DETROIT

A DEPENDABLE SOURCE OF SUPPLY FOR 81 YEARS
 Metals and Metal Products

STEEL, IRON, STAINLESS,
 ALUMINUM, COPPER, ZINC
 AND PERFORATED SHEETS

TIN AND TERNE PLATE

TROUGH, GUTTER AND
 CONDUCTOR PIPE

AIR CONDITIONING AND
 WARM AIR FURNACES

REGISTERS

FURNACE PIPE
 AND FITTINGS

BLOWERS AND CONTROLS

ASBESTOS AND ASPHALT
 ROOFING AND SIDING

TOOLS AND MACHINERY

ONLY *with the* **H&C** TURNING BLADE VALVE

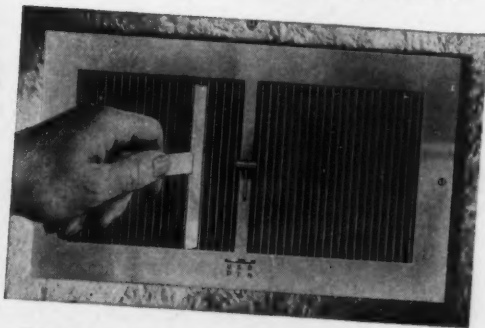
can you Get this Ideal Air Flow!

EVERY BIT OF THE AIR IN THE DUCT IS TURNED EVENLY AND SMOOTHLY!

- Result No. 1:** TURBULENCE IS GREATLY REDUCED!
- Result No. 2:** RESISTANCE IS ACTUALLY LESS THAN IF NO REGISTER AT ALL WERE USED!
- Result No. 3:** VELOCITIES ARE UNIFORM THROUGH EACH PORTION OF THE REGISTER FACE.
- Result No. 4:** SINCE THE ENTIRE FACE IS UTILIZED WITH EQUAL EFFICIENCY, SMALLER REGISTERS IN MANY CASES MAY BE USED AT SUBSTANTIAL SAVINGS.

It's Results that Count

in satisfying old customers and getting new ones. So why not try the new H & C No. 75 Register which incorporates the famous H & C Turning Blade Valve on your next job? It's THE Register you're bound to use eventually if you are interested in BETTER RESULTS at MODERATE COST.



The flexible fins in each section are formed from a single piece of steel and deflection required may be obtained by simply twisting the fins with tool furnished with each item.

The turning blade valve may be instantly adjusted to: UP, STRAIGHT or DOWN. Blades turn every bit of the air smoothly and uniformly to every portion of the register face.



HART & COOLEY MANUFACTURING CO.
FACTORY and ENGINEERING SALES OFFICE: HOLLAND, MICH.

Chicago Office: 61 W. Kinzie St.

FOOD PLANTS NOW PLACING ATTRACTIVE ORDERS FOR STAINLESS SHEET WORK

*... Who's getting
your share of this
profitable business?*

EARLY this year, the Jos. Schlitz Brewing Company, of Milwaukee, lined its wort-cooling room with sheets of U·S·S Stainless Steel. This is just one of scores of stainless sheet jobs recently installed in American food plants. And every day more are being placed, more considered.

If you're not already getting your share, there's no better time than now to start on the trail of these profitable orders. Contact all progressive food plants in your territory. Make sure they know that you are ready and able to handle all their requirements in stainless sheet work. Show them pictures of jobs you have done. Point out that you use the finest materials—including U·S·S Stainless Steel.

Opportunities for stainless sheet work are practically endless. Hotels, restaurants, clubs, stores, hospitals, schools, food and chemical plants, and private homes—all have places where this bright, easy-to-clean metal is needed. Ask the U·S·S specialist to give you any help you need, or write for data.



LIKE A HOUSE OF MIRRORS, Schlitz' new wort-cooler room is completely lined with polished sheets of U·S·S Stainless Steel. The cleanly welded joints provide maximum protection to the freshly brewed beer. Jobs like this are available to the sheet metal worker who specializes on U·S·S Stainless.

**UNITED
STATES
STEEL**



U·S·S STAINLESS STEEL

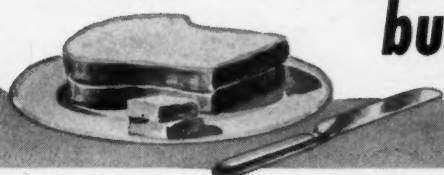
AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
United States Steel Export Company, *New York*
Scully Steel Products Company, *Chicago, Warehouse Distributors*

RYBOLT

CAST IRON FURNACE

SERIES 15

THE GRAVITY FURNACE
—your bread and butter business



Despite the rapid and deserved increase in winter air conditioning business the gravity furnace is still the dominant factor in sales of warm air heating equipment. Of the 450,000 units sold in 1939 it is estimated that 70 per cent were gravity and 30 per cent air conditioning.

That this ratio in favor of the gravity furnace will be continued or even bettered is evidenced by the pronounced trend toward low cost housing. Of the new homes built last year in Chicago, for example, 45 per cent were priced from \$3000 to \$5000, and 32 per cent were priced under \$3000.

The ideal unit to give you your share of this bread and butter business is RYBOLT Series 15, Cast

Iron Coal-Fired Furnace. From the base ring to the improved one-piece radiator Series 15 is an outstanding furnace value that will give your customers ample and dependable heating service with real economy. Special features are the extra large duplex ball bearing grates, waist-high shaking lever, slip-on front casting, one-piece radiator, dust- and gas-tight, new type clean-out door, effective smoke consumer and smoke curtain, extra weight where weight counts and durability throughout.

RYBOLT Winter Air Conditioner Series 157

For the customer who wants automatic heating with all the other advantages of winter air conditioning this RYBOLT Series 157 unit offers the utmost in efficiency, convenience and economy. For its heating element it has the dependable RYBOLT Series 15 Cast Iron Furnace with its economy and high heat power. Blower cabinet may be placed on either side of the unit to facilitate ease of installation. Regular equipment includes Furnace, Furnace Casing, Blower and Cabinet, Blower Switch, Humidifier, Air Filters, Variable Speed Drive Motor. Smooth baked enamel finished cabinet with aluminum finished front. 4 sizes.



WRITE FOR set of folders covering the complete RYBOLT line of Warm Air Furnaces and Winter Air Conditioners.



THE RYBOLT HEATER COMPANY
615 MILLER STREET • ASHLAND, OHIO

**Greater Strength
in Cross-Locked**

DURABILT

**Floor Registers
& Cold Air Faces**

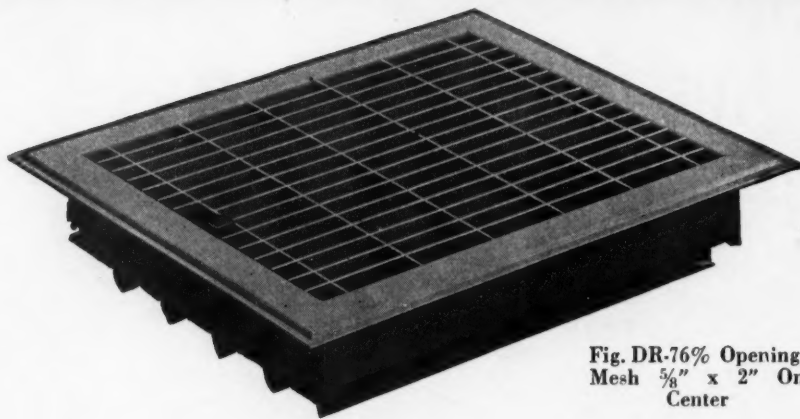
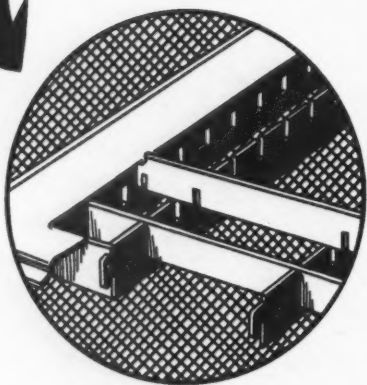


Fig. DR-76% Opening.
Mesh $\frac{5}{8}$ " x 2" On Center

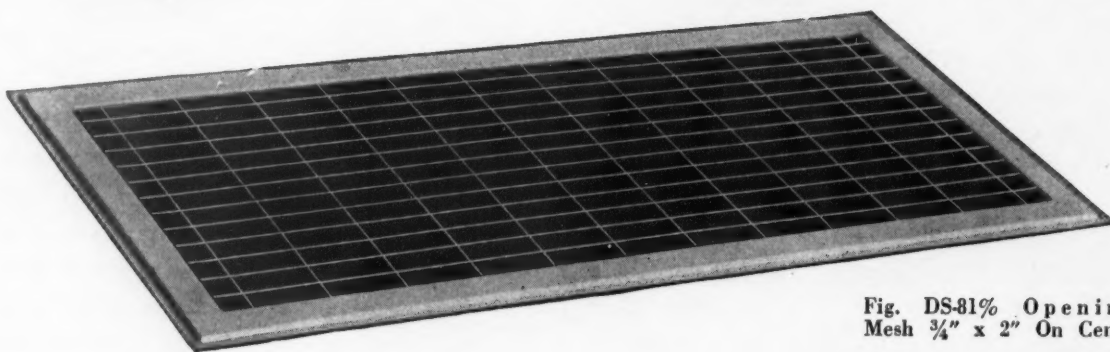


Fig. DS-81% Opening.
Mesh $\frac{3}{4}$ " x 2" On Center

- Multi-lock assembly for surplus strength and extra rigidity.
- All-steel flat bars—mortised at joints, close fitted, perfectly aligned and level.
- Face securely interlocked to frame by tenons at every connection.
- Greater open capacity for air-flow.
- Medium-sized mesh—close enough to exclude French heels and small objects, ample for free air flow. Narrow mesh furnished if desired.

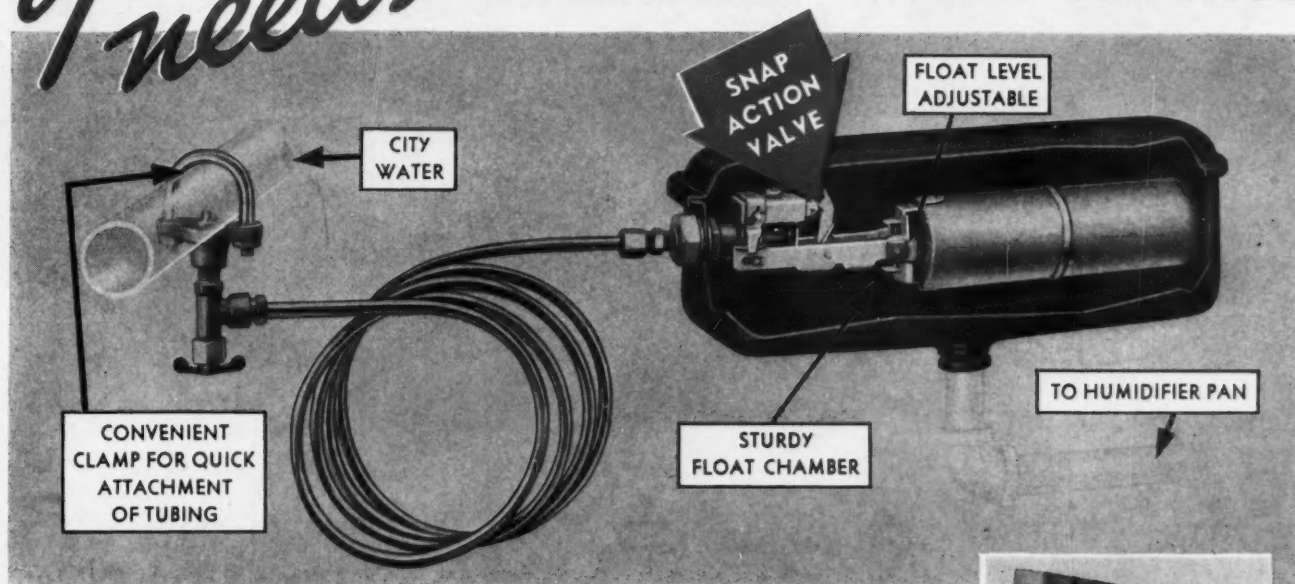
Auer Register Book No. 40, listing and illustrating Auer's complete line of attractive registers and intakes for all warm air heating and air conditioning uses, promptly mailed to you on request.

THE AUER REGISTER COMPANY, 3608 PAYNE AVENUE, CLEVELAND, OHIO

AUER DISTINCTIVE **REGISTERS**
& GRILLES  For Air Conditioning and Gravity

Your needs

designed this NEW McDONNELL HUMIDIFIER WATER CONTROL



YOU needed a humidifier water control that wouldn't "run out" on its job—that wouldn't plug up with dirt or lime and kill the whole humidifying effect.

We studied the causes of troubles with former types—applied our many years of experience in water level control to the problem—developed an automatic valve that you can depend upon.

What does it have that other valves don't?

First of all this control has an entirely new principle. It is not a "seeper" or "dribbler". It has no slightly cracked position. When the water level drops a quarter-inch it snaps wide open. The ingenious cam and roller mechanism accomplishes this snap action. When the water level rises a quarter of an inch the same mechanism snaps it to a tight closure. This snap-opening action gives it plenty of capacity to take care of pans of any size.

A humidifier valve is constantly up against a lot of heat, causing rapid lime formation,

and a lot of dirt that is always present in the pan. When this valve snaps open, its big full stream flushes away the lime and dirt. Its snap closure assures a leak-tight seat even when lime and dirt is present.

On top of this all-essential feature we have incorporated other typical McDonnell refinements. The valve cone is machined from bar stock. It seats against a tough, almost indestructible, special alloy. The float level is adjustable. But despite all these refinements the new control is moderately priced.



WHO SAID LIME? Here is a top view of a McDonnell Humidifier Water Control which we tested for 600 hours in the hardest water we could find with water temperature held at the boiling point and supply water pressure maintained at 56 pounds. IT DID NOT FAIL under these conditions—conditions far more severe than could ever occur under actual working conditions.

**WRITE FOR
ENGINEERING DATA BULLETIN
— it's yours for the asking**

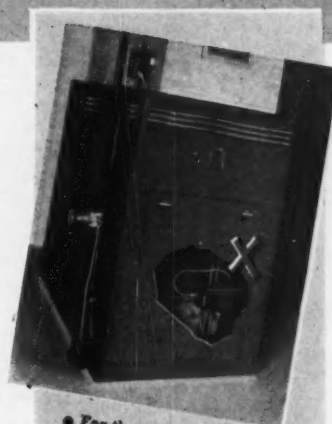
MCDONNELL & MILLER
1318 WRIGLEY BUILDING, CHICAGO, ILLINOIS

MCDONNELL

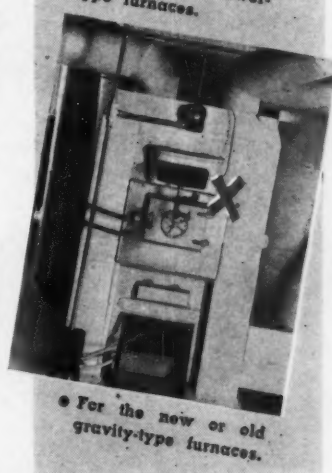
HUMIDIFIER WATER CONTROLS

BOILER FEEDERS AND LOW WATER CUT-OFFS

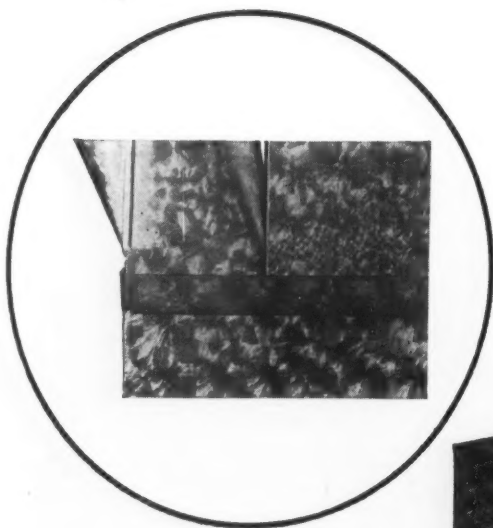
"Doing One **SAFETY** Thing Well"



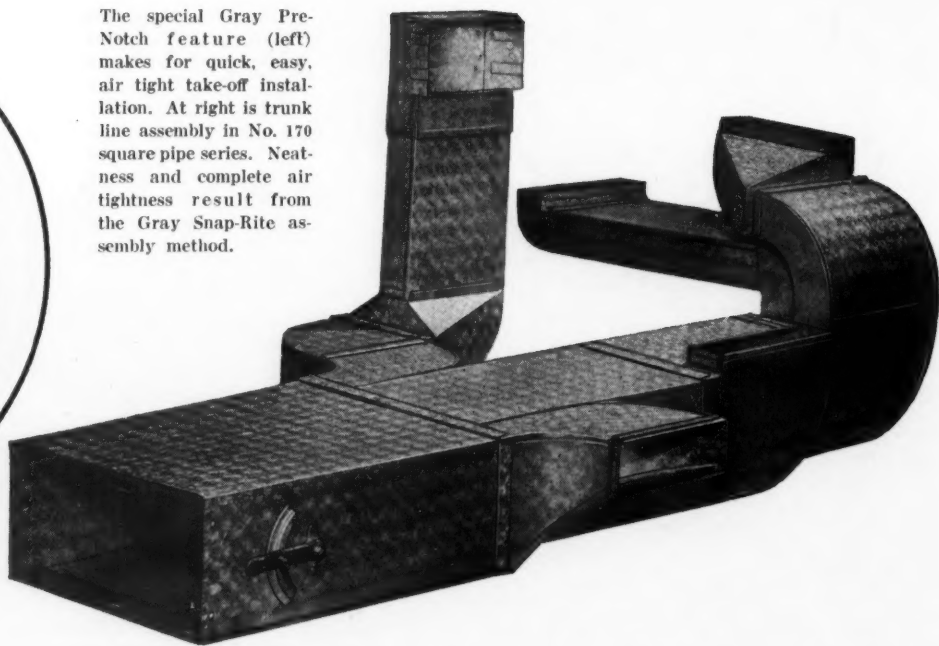
• For the modern blower-type furnaces.



• For the new or old gravity-type furnaces.



The special Gray Pre-Notch feature (left) makes for quick, easy, air tight take-off installation. At right is trunk line assembly in No. 170 square pipe series. Neatness and complete air tightness result from the Gray Snap-Rite assembly method.



Save time, *know* every job is air-tight with *Snap-Rite* pipe and fittings

GRAY GUTTER FITTINGS

provide economy and long life, too. Here is the Gray No. 10 One



Piece Gutter Hanger. Note the reinforcement finger which extends up behind the bead.



Here is how to get quick, easy assembly and erection, freedom from air leaks, and real long-run economy in every air conditioning and warm air furnace installation: use *Gray Snap-Rite Pipe and Fittings* for every job.

Gray Snap-Rite Pipe and Fittings in 28 and 26 gauge galvanized combine all the features necessary for either gravity or air conditioning installations. The new Gray "pre-notch" treatment makes it possible to get perfect branch takeoff installations which are smooth, neat, air tight. "Pre-notch" is an exclusive Gray feature on all trunk pipe, elbows and reducers. All notching on trunk pipe corners and takeoffs is eliminated through this factory made notch.

When you use Gray Fittings and Pipe exclusively you are assured of minimum time in installing and erecting and maximum economy for your customer and yourself.

Write today for Catalog No. 3—see for yourself why Gray Snap-Rite will be your best bet for every job.

GRAY METAL PRODUCTS, INC.
ROCHESTER NEW YORK

GRAY

Snap-Rite

GRAY

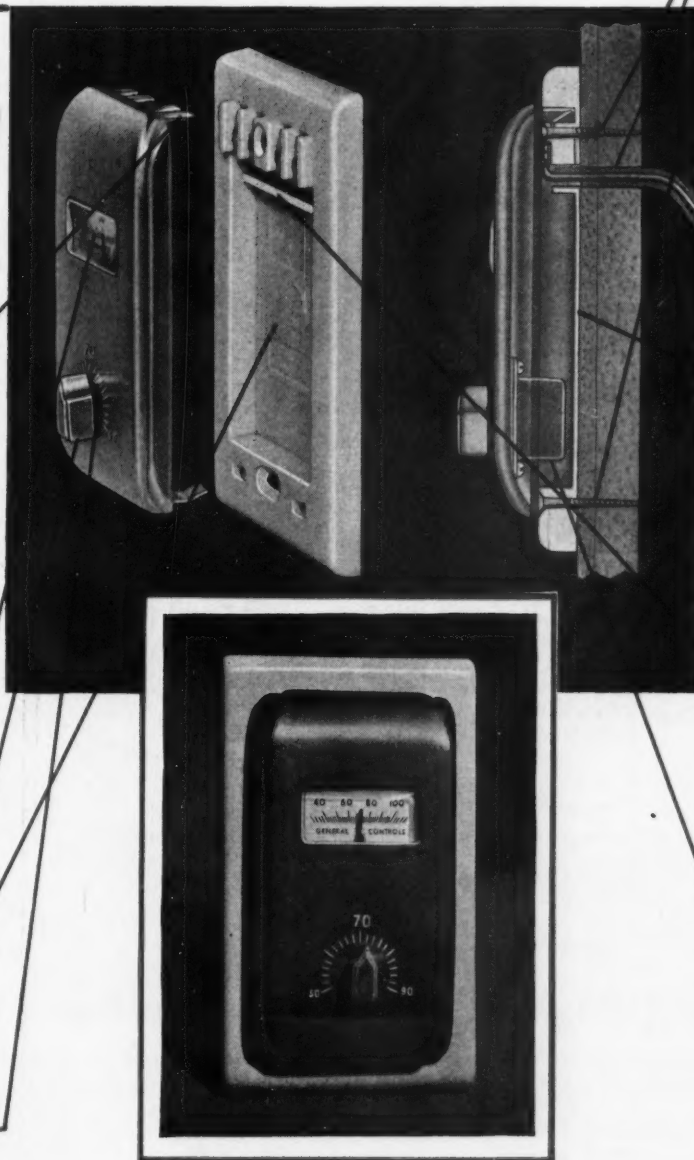
24 *Engineered* FEATURES

IN THIS THERMOSTAT OF TOMORROW

LETS IT LIVE IN EVERY ROOM

AN ENGINEERED EXTERIOR

1. Blending, easily cleaned, lasting, dull chrome finish. Reflects surrounding colors.
2. Standard wall switch box size.
3. Unobtrusive, extends but 13/16" off the wall.
4. Cover snaps on to plastic base. No tools needed for replacement or repairs. All bases standard.
5. Correct parallel design. Walls are vertical, so is thermostat design. No modernistic right angle horizontal lines.
6. The thermally responsive mechanism is the large thermostat cover itself, unhoused, subject to immediate radiant heat and air temperature change.
7. Visible, accurate, bi-metal thermometer. Can be dropped or over-heated without damage. (Thermostat also available without thermometer or with timer.)
8. Base is flexible plastic, of neutral color, absolutely unbreakable. Distortion of base cannot affect thermostat operation.
9. Visible markings on face; no hard-to-read calibrations.
10. No lacquers or paint on cover to retard convected heat transfer.
11. Single knob timer setting control. No chance for errors.
12. Knobs are on surface of thermostat cover. Obviates wall smear or dirt resulting from setting device being near wall.



AN ENGINEERED INTERIOR

13. Intimate contact between cover and bi-metal; bi-metal power increased 100%.
14. Only two essential mounting screw holes and 1/4" control cable opening necessary in wall.
15. Elongated screw hole at bottom of base permits leveling of device.
16. SURFACE MOUNTED with flush appearance. No recess in wall.
17. Bi-metal differential only 1/4° F., without false heat input. Only one thermal lag. Cover plate readily follows room temperature. Action is as fast as any standard mercury thermometer.
18. Plastic base acts as blanket to thermally isolate thermostat from wall. Walls are not always at room temperature and wall drafts are common to most rooms; also, thermostat is free from immediate wall radiation.
19. All terminals easily accessible for wiring.
20. Ridge in plastic base keeps wiring from mechanism.
21. Small wire inlet eliminates internal wall draft factor.
22. Dust and dirt eliminated by suitable gasketed cover and felt washers.
23. Internal mechanism accessible by screwed housing, rubber gasket sealed.
24. Genuine platinum alloy contacts. (Not platinum substitute.)

ALL THIS AND *Beauty* TOO IN THE NEW
GENERAL CONTROLS T-80 SERIES REGULAR
THERMOMETER AND TIMER THERMOSTATS
for use with all B-60 Series ALL-GAS gas heating controls

GENERAL  **CONTROLS**

450 East Ohio Street, Chicago, Illinois • 25 North Live Oak Street,
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"The PEOPLE'S CHOICE"



Gravity Registers OF TIME- TESTED QUALITY AND BEAUTY

Wherever you go, in all Classes of the Great American Home, you'll find these U. S. Gravity Registers preferred for their Practical Construction Features and Low Popular Prices.

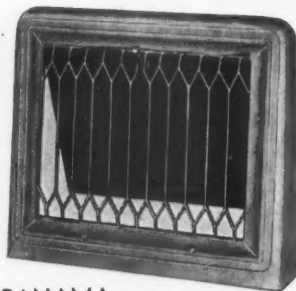
NATIONAL was the first perfected Leak-Proof Gravity Baseboard Register. PANAMA continues to represent the neatest in Vertical-Bar Designs.

The No. 400 U. S. TRUSSTEEL with its perfect seamless corners, 82% free area, Heel-Proof construction, and the No. 300 U. S. EMBOSSED-BAR of extra-strength—both present the UTMOST in Quality, Capacity, and Strength—have set the pace in floor registers.

You can not do better in your business than to make the people's choice your choice for Fall installations.



NATIONAL



PANAMA

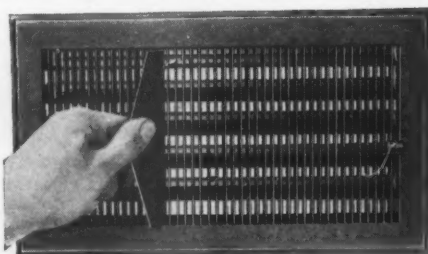
No. 400
U. S.
TRUSSTEEL

No. 300
U. S.
EMBOSSED
BAR

COLD AIR
FACES
TO MATCH
TRUSSTEEL
No. 405

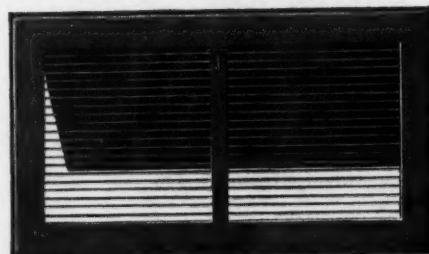
EMBOSSED BAR
No. 305

Air-Conditioning Registers for Every Directional Flow Requirement



Style No. 256 Flex-Bar Register

Whatever your Directional-Flow needs, U. S. has a wide variety of registers to handle each job to perfection. Popular 4-Way Flow Register is the new Style 256 Flex-Bar with knob-adjusted back Multiple Valves, and with easy-set bendable bar grilles. For Quality Low-Cost Directional Flows the famous Style 153 Louver-Type Register with U. S. Inset Panels is Unequaled. Send for latest Catalog and Prices on the complete U. S. Air-Conditioning Line.



Style No. 153 Louvre-Type Register

Stocks Maintained at All Branch Warehouses and by the Outstanding Jobbers of Heating Equipment.



UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY • SAN FRANCISCO • NEW YORK, N. Y.

CANADIAN MANUFACTURING DISTRIBUTORS — Canada Register & Grille Co., Ltd., Toronto, Ontario

JANITROL'S

SOLUTION TO SALES RESISTANCE!
A New COMPLETE LINE OF HEATING EQUIPMENT THAT IS
 "TRACKING DOWN" GREATER SALES VOLUME WITH ITS MANY
Big "Plus" Features!

● "What do you mean . . . *Plus Features?*" Well . . . it's the ice cream on the apple pie! It's something to offer that the other fellow hasn't got! That free dipper of ice cream would make the best apple pie in the world sell more easily and in greater volume.

When you handle gas-fired Janitrol Products, you have many *plus features* to talk about . . . to really shout about! Every furnace has a burner and a heat exchanger, but only Janitrol has the "Multi-Thermex Tube" heat exchanger, only Janitrol has the "Amplifire" burner! Such things . . . and there are many of them . . . enable the Janitrol dealer to build a very profitable sales volume.

THE GRAVITY FURNACE WITH THE "HORIZONTAL AIR-FLOW" PRINCIPLE

Janitrol's new GAC Gravity Furnace was developed to meet a very real heating need. There are many new homes where a "gravity job" is the answer to the heating problem . . . there are many old homes where the replacement unit must be of the gravity type. The "Multi-Thermex Tube" cast iron heat exchanger . . . the "Amplifire" burner . . . extremely low over-all height . . . these are just a few of the "plus features" the GAC offers.



THE WINTER AIR CONDITIONER WITH "TOMORROW'S" DESIGN

Introduced in March, 1940, the FAC Janitrol has already established an amazing acceptance! Every heating man . . . every architect and builder . . . who has inspected the FAC compliments it in "you have something there" language. It's a real quality product and volume production makes it available at moderate price. Popular sizes come factory assembled, too . . . and that means factory tested.



WINTER AIR CONDITIONERS
CONVERSION BURNERS
UNIT HEATERS



SURFACE COMBUSTION CORPORATION

JANITROL

TOLEDO, OHIO

On that NEW Line of



Gravity-Fed Oil Furnaces

Look for the Controls! They Add.. *Extra* **DEPENDABILITY!**

★ A-P DEPENDABLE Control Units Recently Designed for NEW Oil Burning Gravity-Fed Furnaces . . . Look for them on YOUR New Line!

Those NEW GRAVITY-FED FURNACE MODELS that will pour out of research and designing laboratories this year — they're the life-blood of your heating business! They'll give you a new idea in low-cost Home Heating.

But when these new creations come to YOU, you will want, first of all, definite PROOF of PERFORMANCE! You will want to be sure that they give your customer a greater value for his money in improved efficiency, economy, and convenience. Then you can really push their sale with enthusiasm — and profit.

Here's a suggestion that may help you judge their worth. If these new furnaces burn oil by gravity . . . LOOK FOR THE A-P CONTROLS!

An A-P Control on any unit is your assurance of accurate fuel control and temperature regulation. It's regarded by thousands as the final "stamp of approval" — a sales advantage that you can pass on to your customers with complete confidence.

★ Remember! Gravity-Fed Equipment Can Be No Better Than Its Control!

Add . . .

to your Sales and Profits this year with A-P DEPENDABLY CONTROLLED Heating Plants!

AUTOMATIC PRODUCTS COMPANY
3422 NORTH THIRTY-SECOND STREET
MILWAUKEE WISCONSIN

FOR OIL BURNING HEATERS . . .



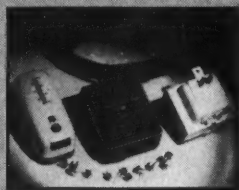
A-P Constant Level Oil Control with FUEL COMPENSATOR



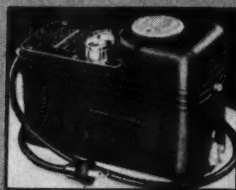
A-P Thermo Elec. Heat Regulator Set for Thermostatic Control



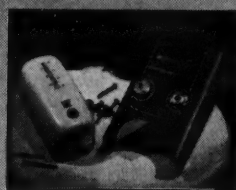
A-P Manual Fan Switch Conversion Top



A-P Conversion Top with Forced Draft or Circulating Fan Switch

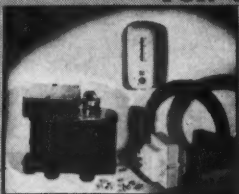


A-P OILIFTER Draws Fuel from remote Bulk Supply

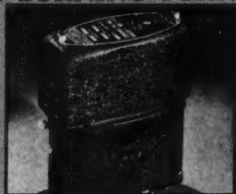


A-P OILIFTER Thermostatic Heat Regulator Set

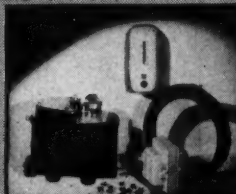
FOR OIL BURNING FURNACES . . .



A-P Thermo Furnace Control Set with Forced Draft or Circulating Fan Switch



A-P Thermostatic Furnace Control Set—Relay type

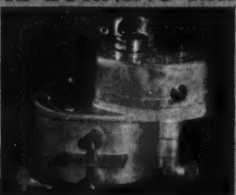


A-P Thermostatic Furnace Control Set—Heat Motor Type

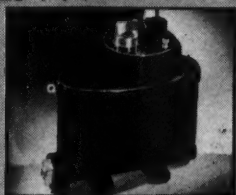
FOR OIL BURNING RANGES . . .



A-P Manual Oven Constant Level Oil Control



A-P Thermostatic Oven Control with Safety Overflow

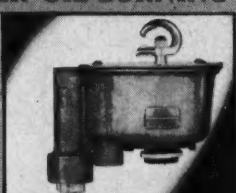


A-P Thermostatic Oven Control with Safety Constant Level Valve

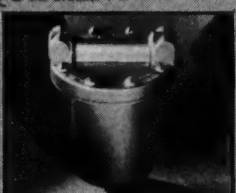
FOR OTHER OIL-BURNING EQUIPMENT



For Hot Water Heaters . . . A-P Thermostatic "Snap Action" Control



For Mobile Units . . . A-P Safety Trailer Control



A-P Fuel Oil "Trap-It" Traps Dirt and Water



“It’s the Best Dealer Set-up a man could hope for!”

(Reading time 2½ minutes)

LISTEN to this newly appointed G-E Dealer tell his banking friend about a good investment in personal security.

“Morning J. B. Remember we talked about my taking on the General Electric lines? Well, I’m now the G-E Dealer for this area.

“Since we’ve been doing business together for a long time, I think you’ll be interested in my new set-up.

“In the first place I can sell you—and other home owners or business owners—the finest heating, cooling, air conditioning and refrigeration equipment that money can buy. That’s no rash promise, either. I can prove it. Now, I want to tell you why I settled on General Electric.

TESTED PRODUCTS

“Before they put a nickel’s worth of these products on the market eight years ago, they spent five years and many thousands of dollars in their laboratories making them work. Designing, developing and testing.

“Every year since, they’ve continued to spend plenty of money making ’em even better.

“You know it’s mighty useful and important to have all the resources of a company like G-E behind you.

“The net result is every customer gets a working piece of machinery, that doesn’t have to be serviced every few weeks. That will keep him happy for a long time to come.

A PRODUCT

FOR EVERY PROSPECT

“For instance—a completely automatic warm air heating plant. Burning either gas or oil. Any combination to fit.

To operate economically. To give the last word in comfort. And which is really something special when it comes to operating and safety controls.

“Then there’s the second complete line—of summer cooling units. For one room or a whole store. Whether the prospect wants to sleep better at night or bring more customers into his store, he can do it with G-E ‘packaged’ air conditioning.

“And I’ve got still a third line with lots of prospects. For water and beverage coolers. For what the grocer or butcher or delicatessen man calls walk-in and reach-in cabinets. And for condensing units. (There’s a steady replacement business in these alone).

YEAR ’ROUND PROFITS

“There you have the three lines. As a good business man yourself, you’ll agree with me that it makes sense to sell all three. Not just one as I used to.

Then when the heating season bogs down, cooling and commercial refrigeration sales step up. To me this means keeping everybody busy and year ’round profits. You call it straightening out the sales curves.



Cooling

REAL DEALER SUPPORT

“Now, in addition to good products, G-E offers a dealer special training in selling, in organizing sales, in training service groups and in engineering. The dealer is backed up by both national and trade paper advertising. He gets direct mail campaigns. Good selling



Commercial Refrigeration

literature and co-operation on local newspaper advertising. Actually—’most everything he needs to help him do business.

“Well, there you have it. You can see what it means to be a G-E dealer. Both our town and my business are going to benefit!”

GENERAL ELECTRIC

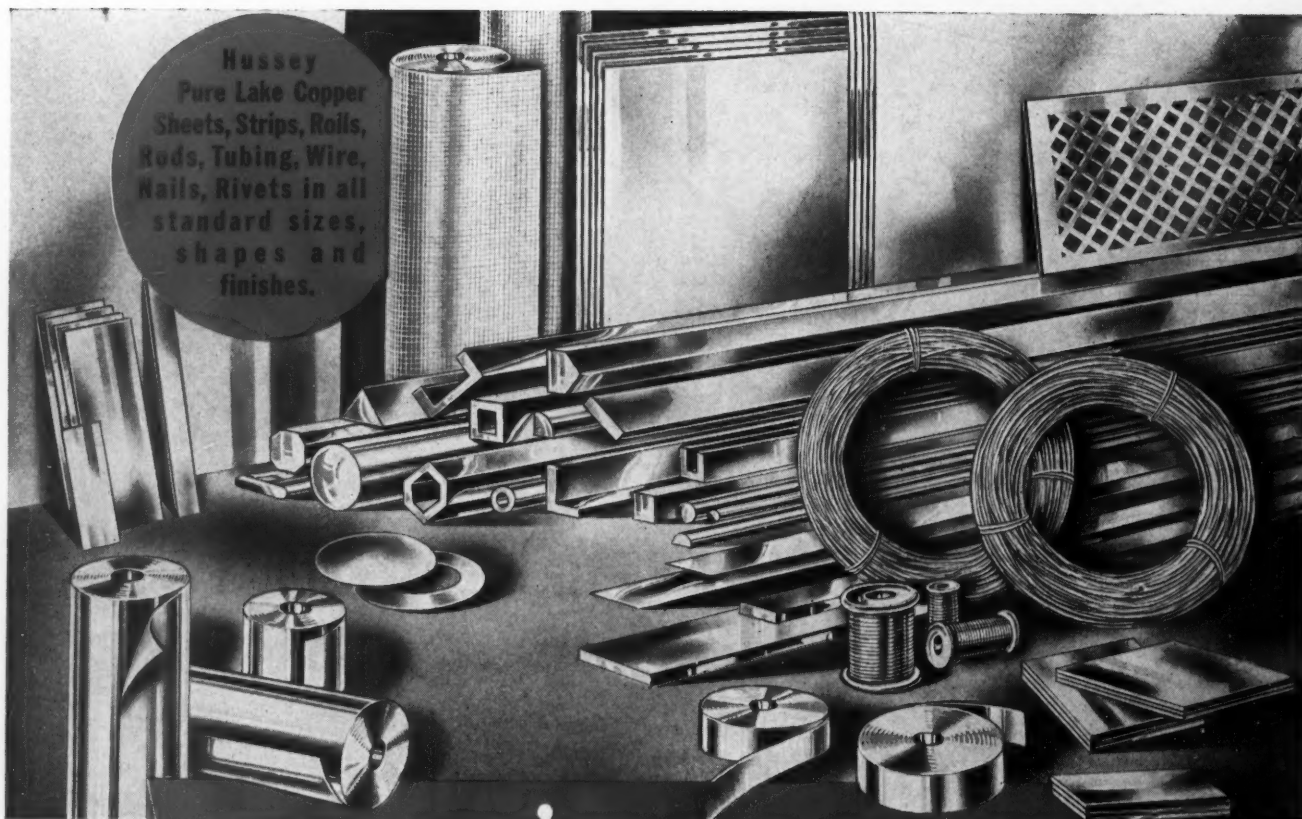
General Electric Co.
Div. 199-853, Bloomfield, N. J.

I want all details on the G-E Dealership for my territory.

Name _____

Street _____

City _____ State _____



Hussey
Pure Lake Copper
Sheets, Strips, Rolls,
Rods, Tubing, Wire,
Nails, Rivets in all
standard sizes,
shapes and
finishes.

WHEN YOU'RE IN A HURRY FOR COPPER IN ANY FORM

Check
your local Hussey Warehouse below:

Chicago Warehouse
212 S. Jefferson St., Chicago, Ill.
Telephone HAYmarket 5607

Cincinnati Warehouse
424 Commercial Square, Cincinnati, Ohio
Telephone MAin 2833

Cleveland Warehouse
5318 St. Clair St., Cleveland, Ohio
Telephone HEnderson 7695

New York Warehouse
140 Sixth Ave., New York, N. Y.
Telephone CAnal 66326

Philadelphia Warehouse
1632 Fairmount Ave., Philadelphia, Pa.
Telephone FREmont 5037

Pittsburgh Warehouse and Rolling Mills
2850 Second Ave., Pittsburgh, Pa.
Telephone GRant 3650

St. Louis Warehouse
1620 Delmar Blvd., St. Louis, Mo.
Telephone CEntal 9192

Phone YOUR HUSSEY WAREHOUSE!

Copper deliveries are never a problem when you deal with the Hussey organization—backed by seven conveniently located warehouses in every industrial center.

Through Hussey you always get direct action on the double-quick, through an efficient, high-g geared warehouse organization that is ever alert to your requirements, large or small.

Complete stocks of copper sheets, rolls, rods, tubing and wire, as well as a full line of roof drainage products and other pre-fabricated forms are maintained at all times, ready for your every emergency.

Why not make a memorandum of your local Hussey Warehouse listed to the left, and give us a call?

C. G. HUSSEY & COMPANY

(Division of Copper Range Co.)

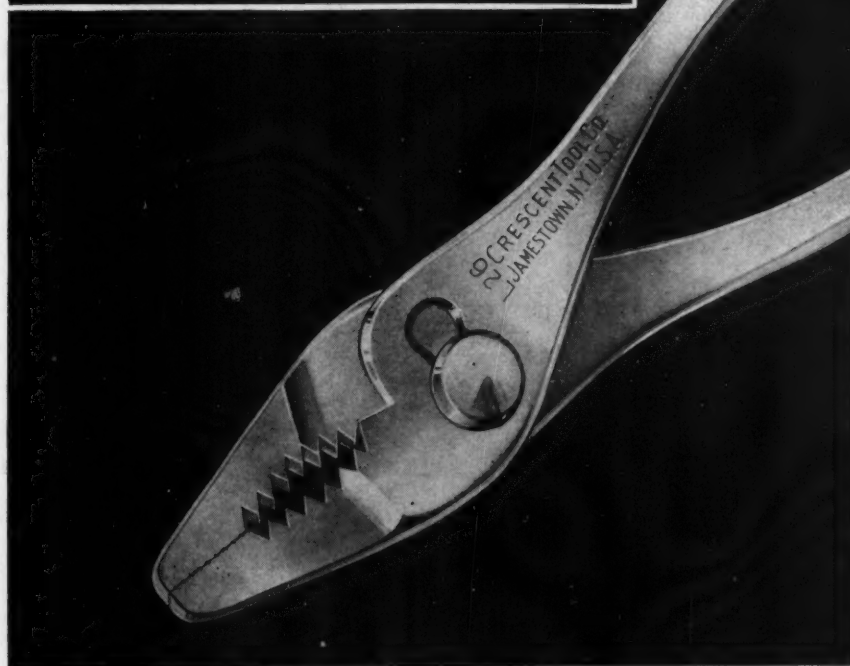
ROLLING MILLS AND GENERAL OFFICES: PITTSBURGH, PA.

Copper

HUSSEY

Brass

CRESCENT SLIP-JOINT PLIERS



From this complete line of Crescent Slip-Joint Pliers you can pick a type and size to meet your exact requirements. They range in price from 25¢ (for 6" size) to \$1.00. All are drop-forged from special analysis steel and have sharp milled teeth for extra gripping power. Nuts and bolts are turned from a solid bar of steel and are case-hardened. Joints work smoothly and hold the jaws true and square. Clean design and comfortable hand grip are combined in a construction which provides ample strength.

The Crescent line includes Thin and Standard types, Straight and Bent Nose patterns, Side and Shear Cutters—handsomely finished in Nickel or Chrome-plate. Ask your Hardware Dealer or Supply House, or write for the new 1940 Crescent catalog of fine Hand Tools.

30-164

CRESCENT TOOL COMPANY JAMESTOWN, N. Y.



CeeTeeCo COMBINATION PLIERS

4 sizes, 5 to 10". H 26 (bulk packing) 25c retail.



MOTOR KIT COMBINATION PLIERS

4 sizes, 5 to 10". G 26, 50c retail.



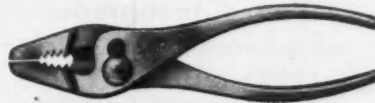
CRESCENT THIN STRAIGHT NOSE PLIERS

4 sizes, 5 to 10". L 26, 50c retail.



CRESCENT UNIVERSAL PLIERS

7" size only. D 27, 60c retail.



CRESCENT SIDE-CUTTING SLIP-JOINT PLIERS

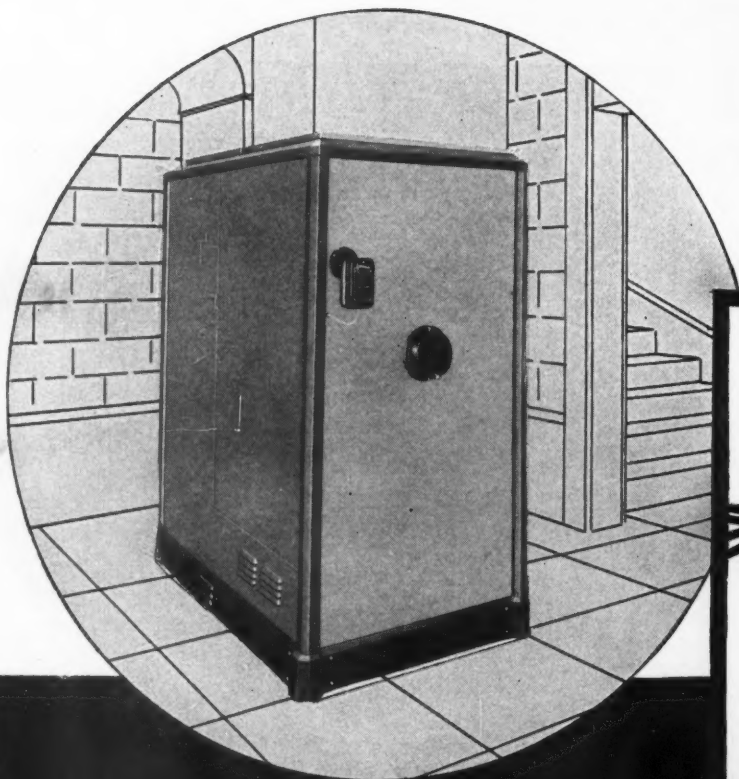
6" size only. LS 26, 80c retail. Also No. 950 with side cutter in 2 sizes.



CRESCENT THIN BENT NOSE PLIERS

6" size only. J 26, 60c retail. Also No. 926 with bent nose in 2 sizes.

CRESCENT and Smith & Hemenway TOOLS



**Century's Motor Specialization
+ Correctly Engineered Application
= Satisfaction and Economy.**



Century MOTORS



**Protect Your Installations
Against Breakdowns Caused by
Moisture and Damp Basements**

for

Your Convenience

Century Motor Specialists are located in these key centers:

Atlanta • Baltimore • Boston
Buffalo • Chicago • Charlotte
Cincinnati • Cleveland
Dallas • Denver • Davenport
Detroit • Houston • Indianapolis
Los Angeles • Milwaukee
Minneapolis • New Orleans
New York • Omaha
Philadelphia • Pittsburgh
Rochester • Salt Lake City
San Francisco • Spokane
Seattle • Tulsa



TO GUARD against destructive effects of moisture, damp basements and lubricating oils, Century fractional horsepower motors are built like larger Century motors.

Laminated slot insulation is built up of varnished fabric for electrical strength and heavy fibre for mechanical strength. Century uses this type of slot insulation on all sizes of motors.

Century's exclusive insulation treatment thoroughly saturates the winding with insulation compound which resists moisture absorption — cements coils together — prevents chafing between wires — is thin enough to radiate heat — resists mechanical abrasion.

Buy this added protection for motors that "sweat" during the summer in damp basements and humid climates, which are called on to start on the first cold day before they have had a chance to dry out.

Makes friends because the equipment you sell builds satisfaction.

A Century Motor Specialist who lives near you will gladly help select the right motor.

CENTURY ELECTRIC COMPANY

1806 Pine Street

St. Louis, Mo.

One of the Largest Exclusive Motor Manufacturers in the World



59 WEIR YEARS

No. 59 is up! Away back in August 1882 WEIR, the original STEEL warm-air furnace came into being.

In 1882 locomotives wore "funnels," and "cow-catchers" were exactly that. Automobiles were dreams in lame brains—and not even the Wright Brothers believed in "aeroplanes."

Today there are Weir furnaces of the vintage of 1882 still on the job and many thousands of 40 to 50-year-olds still serving faithfully.

Why? Because Weir furnaces, then and now (and all the years in between) had years and years and years of service BUILT INTO THEM!

That fact is the foundation of the success of this Company and of our dealers today. Weir Dealerships became Weir Profitships—and 25-year-old dealerships are no rarity today.

Change and Progress Go Hand-in-Hand

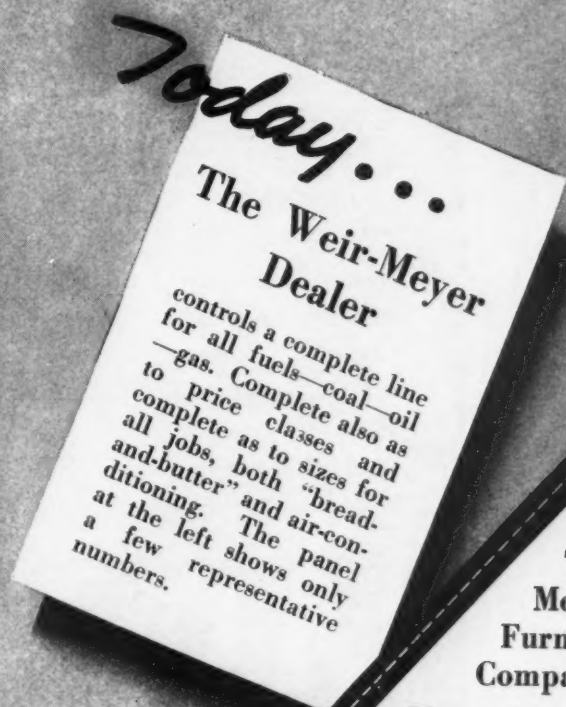
and, whereas a single series of furnaces for coal-firing-by-hand was our "line" in years gone by, the years have seen this Company not only keeping in step, but always out in front in the development of improved design for efficiency and convenience as well as "eye-appeal."

If you want to know the "why and wherefore" of dealers sticking to Weir year after year, send the coupon NOW and make this YOUR "Weir Year."

Manufacturers of Weir and Meyer Furnaces and Air Conditioning Equipment for Coal, Oil and Gas.

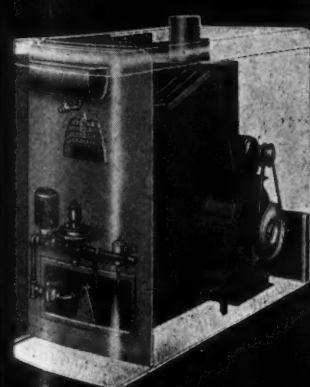
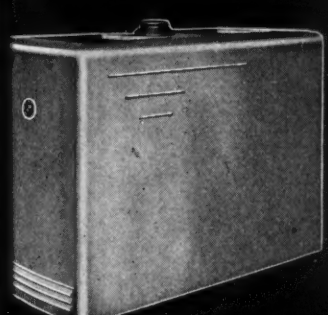
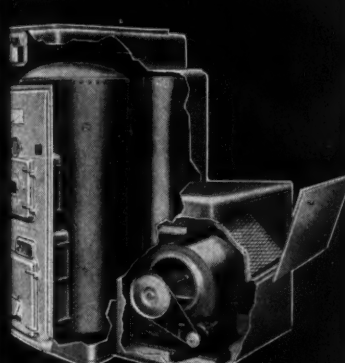
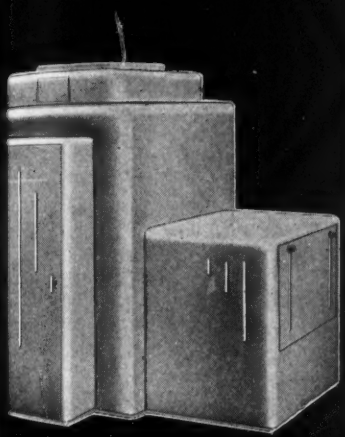


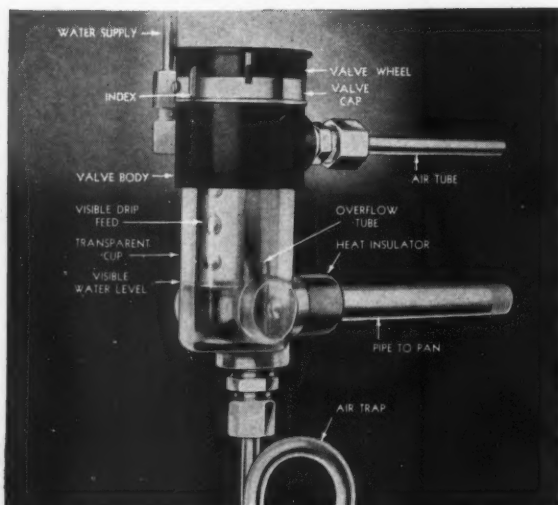
Who
Makes
It
Makes
A
Difference



The
Meyer
Furnace
Company

Please advise how
and why Weir-Meyer
dealers have been and
are making money year
after year.





MEET MONMOUTH MICRO-FEED

*Revolutionary Efficiency
Amazing Low Price*

Costing no more than make-shift devices—offering five major advantages—this scientific water feed control constitutes an important step forward in low cost humidifiers.

Precision die molding and quantity production make possible a low price without sacrifice of durability, dependability and accuracy of operation.

1. SIMPLICITY OF STRUCTURE: The Micro-feed is simply a fine valve permitting close control of drip feed rate by means of the valve wheel at the top. No expanding element or automatically moving parts to give trouble.

2. WATER FEED AND LEVEL PLAINLY VISIBLE in the sealed transparent plastic feed cup. Owner sees exactly what is being done.

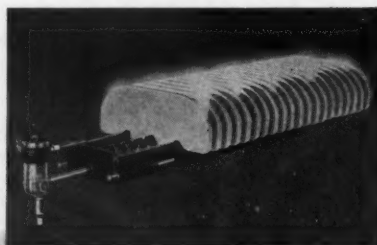
3. CORRECT HUMIDITY CONTROL PRINCIPLE: The constant feed rate, plus Nature's unfailing laws of humidity, result in the room humidity automatically becoming lower as the temperature of weather, walls and windows becomes lower. This ideal weather graduated hu-

midity control eliminates moisture condensation in walls and excessive condensation on windows. All the owner need do is to maintain the easily found correct feed rate, regardless of weather. The rest is fully automatic.

4. CORROSION PROOF: The main parts are die molded of a new, tough, uncorrodable plastic material to precision dimensions. The valve seat is chrome nickel steel alloy, completely proof against corrosion and water wear.

5. LIME PROOF: The enclosed valve and air sealed feed cup makes lime deposits impossible—proved by years of service on all kinds of water.

Every dealer, jobber and furnace manufacturer using old fashioned humidifiers is invited to test and compare the Micro-feed type humidifier on any basis whatsoever—price, appearance, performance or salability.



Your inquiry will be appreciated and will receive prompt attention.

MONMOUTH PRODUCTS COMPANY
1933 E. 61st Street
Cleveland Ohio

MONMOUTH

The Greatest Name in Humidification



— YOUR CUSTOMERS WANT

Chronotherm

BECAUSE

"CHRONOTHERM is 28 1/4% lower in price"

"CHRONOTHERM is a necessity - not a luxury"

"CHRONOTHERM gives real comfort and increases enjoyment of living"

"CHRONOTHERM makes the heating plant completely automatic"

"CHRONOTHERM is a modern, accurate, electric time piece"

"CHRONOTHERM is a definite contribution to better living"

"CHRONOTHERM provides 150 hours more sleep each heating season"

"CHRONOTHERM saves fuel"

"CHRONOTHERM pays dividends year after year"

"CHRONOTHERM is an investment you can't afford to overlook"

— YOU SHOULD RECOMMEND

Chronotherm

BECAUSE

"CHRONOTHERM gives you more profit on every job"

"CHRONOTHERM increases your thermostat profit more than 300%"

"CHRONOTHERM is easier to sell because of its new low price"

"CHRONOTHERM makes your job completely automatic"

"CHRONOTHERM makes more satisfied customers - more sales"

HANDSOME ILLUMINATED DISPLAY *Free* TO DEALERS WITH INITIAL ORDER

MINNEAPOLIS-HONEYWELL

MINNEAPOLIS-HONEYWELL REGULATOR CO., MINNEAPOLIS, MINNESOTA.
CANADIAN PLANT: TORONTO, ONTARIO. EUROPEAN PLANT: LONDON,
ENGLAND. COMPANY OWNED BRANCHES IN FORTY-NINE OTHER CITIES

Control
SYSTEMS

Designed to Sell!

The New **CONTROLAIRE***

The "Controlaire" Oil Fired Conditioning Unit is one of the finest, most efficient, most attractively styled pieces of automatic heating equipment available today. It is precision built to exacting specifications, then tested in actual use to assure owners amazing performance results.

Mechanically perfect, the "Controlaire" is also smartly modern in appearance. The entire unit is enclosed in a single cabinet which, with its two-tone finish of baked enamel, is actually as attractive as a fine piece of furniture.

Write us today for literature, sales rights, and prices.



*Sizes ranging from 80,000 to 250,000 BTU at register.

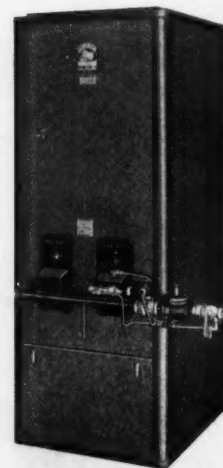
A Complete Line of Furnaces for Every Purpose—



More than 50 years of continuous acceptance for the "Home Comfort" line of Furnaces—plus the confidence and goodwill of thousands of home owners—those are the things that make selling easy for YOU! You build volume and increase profits when you sell "Home Comfort."

Assure COMFORT for the HOME by installing "HOME COMFORT" Furnaces. Enjoy the benefits that come with satisfied customers.

Join our successful Dealer Organization TODAY! Write for full details and exclusive franchise rights. Let us help you make more money! DO IT NOW!



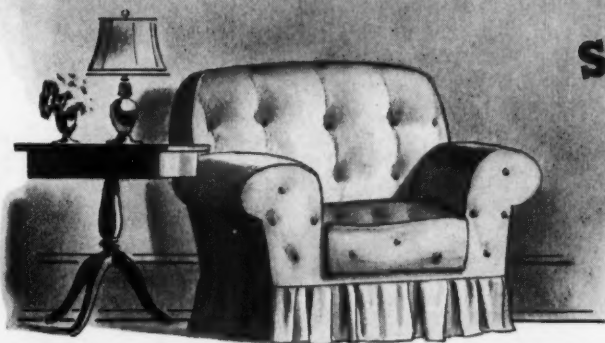
ST. LOUIS FURNACE MFG. CO.

2901-II ELLIOT AVE.

ST. LOUIS, MISSOURI

MANUFACTURERS OF FAMOUS "HOME COMFORT" FURNACES FOR 50 YEARS

SOME LIKE 'EM HIGH...



SOME LIKE 'EM LOW...



THE DELCO TWO-SPEED MOTOR IMPROVES BOTH



DELCO MOTORS
For Stokers, Oil Burners,
Blowers, Compressors

Featuring Delco Thermotron for complete overload and over-heat protection—listed by Underwriters . . . Delco Centrifugal Switch for quiet starting . . . Delco End-Play Take-Up Device for further reduction in vibration.
Service for Delco motors is available nationally through United Motors Service.

The controversy as to whether duct outlets in forced air systems should be high or low still rages . . . with much to be said for both methods. Out of it all comes this noteworthy fact: Whichever solution you choose, a Delco Two-Speed Motor for blowers will make it more effective and satisfactory.

With a two-speed motor, the blower operates at slow speed a majority of the time, eliminating uncomfortable drafts and greatly reducing the temperature over-run experienced with a single-speed motor.

Like all types of Delco motors, the Delco Two-Speed Motor is *dynamically balanced* to insure exceptional freedom from vibration and quiet operation. Bearings, shafts, frame and mountings are machined to very close limits, and motors are thoroughly tested before leaving the factory.

Whether your power requirements call for a 1/8-h.p. motor or a 50-h.p. motor, you will find there is a Delco motor to meet your needs. Consult the Delco Products Engineering Department.



STORM WINDOWS ARE ON YOUR SIDE—

The forceful 1940 L·O·F campaign will create sell automatic heat and

You don't sell Window Conditioning (storm windows). But it will be worth your while to stress its advantages in your contacts with building contractors, home owners and prospective home builders.

These are the potential prospects for your equipment. And all will recognize the merits of Window Conditioning—outstanding advantages that bring automatic heat and air-conditioning equipment within the reach of more and more people. Here are the reasons:

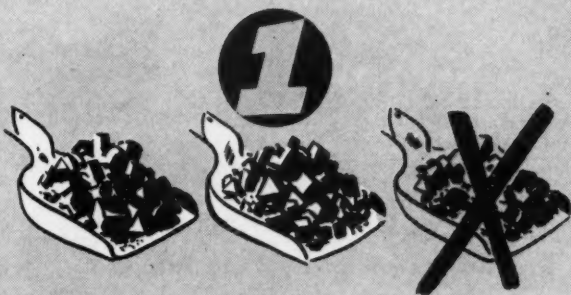
The L·O·F Window Conditioning Campaign this fall will be bigger, better, more forceful than ever before. CONVINCING ADVERTISEMENTS IN FIVE LEADING NATIONAL PUBLICATIONS . . . DEALER SALES HELPS . . . AN APPEALING 66-STATION, COAST-TO-COAST RADIO PROGRAM . . . THE WIDESPREAD DISTRIBUTION OF ATTRACTIVE, INTERESTING CONSUMER BOOKLETS.

This program will impress people in every block of every community with the benefits and economies of Window Conditioning. And it will create a lot of prospects for you. You'll be well repaid if you tie in with something that reduces the operating cost and increases the efficiency of the equipment you sell. And when you see a house with storm windows in place or being put up—that's your cue to start selling! Libbey-Owens-Ford Glass Company, Toledo, O.

LIBBEY·OWENS·FORD

TO BOOST YOUR SALES AND PROFITS/

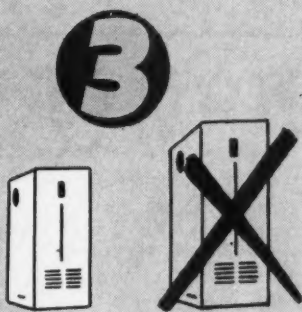
Window Conditioning new opportunities to air-conditioning equipment



1
Window Conditioning reduces fuel bills—in many cases as much as 30%. THAT MEANS THAT MORE PEOPLE CAN AFFORD AUTOMATIC HEATING EQUIPMENT—AND CAN PAY FOR IT OUT OF FUEL SAVINGS.



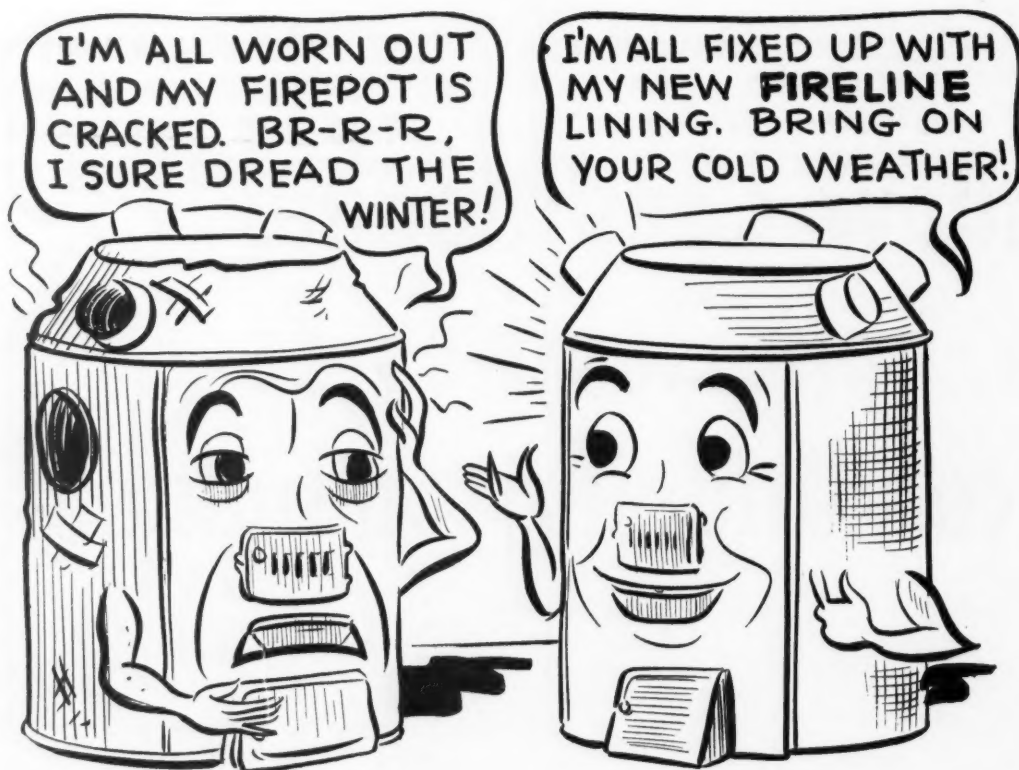
2
Window Conditioning helps get rid of the nuisance of foggy windows, excessive condensation that damages draperies, walls, rugs and woodwork finishes. THAT MEANS THE ELIMINATION OF THE ONLY DRAWBACK TO WINTER AIR CONDITIONING.



3
Window Conditioning permits the use of smaller and less costly heating equipment without impairing heating efficiency. THAT MEANS REDUCED SALES RESISTANCE TO THE EQUIPMENT YOU SELL.

QUALITY GLASS





One out of every three furnaces is burned out—has a checked, cracked, or broken firepot that should be replaced or repaired. Here's a tremendous volume of business that is much easier to get with Fireline than in any other way because Fireline will make any firepot gas-tight at minimum cost, where cost is the controlling factor.

Fireline will make any new firepot you install burn-out-proof at extra profit to you. Installed right through the fire door one to 1½" thick over the entire inside wall of the firepot, Fireline sets with an ordinary fire into a snug-fitting, one-piece, refractory lining.

Recommend Fireline with confidence for it steps up the heat-producing capacity of the furnace, raises combustion temperature, and reduces smoke, soot and ashes. Each Fireline job means another satisfied customer.

ACT TODAY!

Fireline is stocked by leading jobbers in 50 and 100-lb. drums. Order from your jobber or write us for bulletin, prices and sales helps.

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury St., Chicago, Ill.

Gentlemen:

Please rush me complete information, prices, and sales helps on

Fireline..... Ironset.....

Name

Street

City..... State.....

FIRELINE Every Firepot— Old or New

Fireline gives you an extra profit on every job for Fireline will support a good labor and material profit and still save your customer money.

Fireline is ideal for replacing fire tile in steel furnaces, also for setting stokers and oil burners.

IRONSET

Is a better furnace cement for setting-up new furnaces or re-setting old units because:

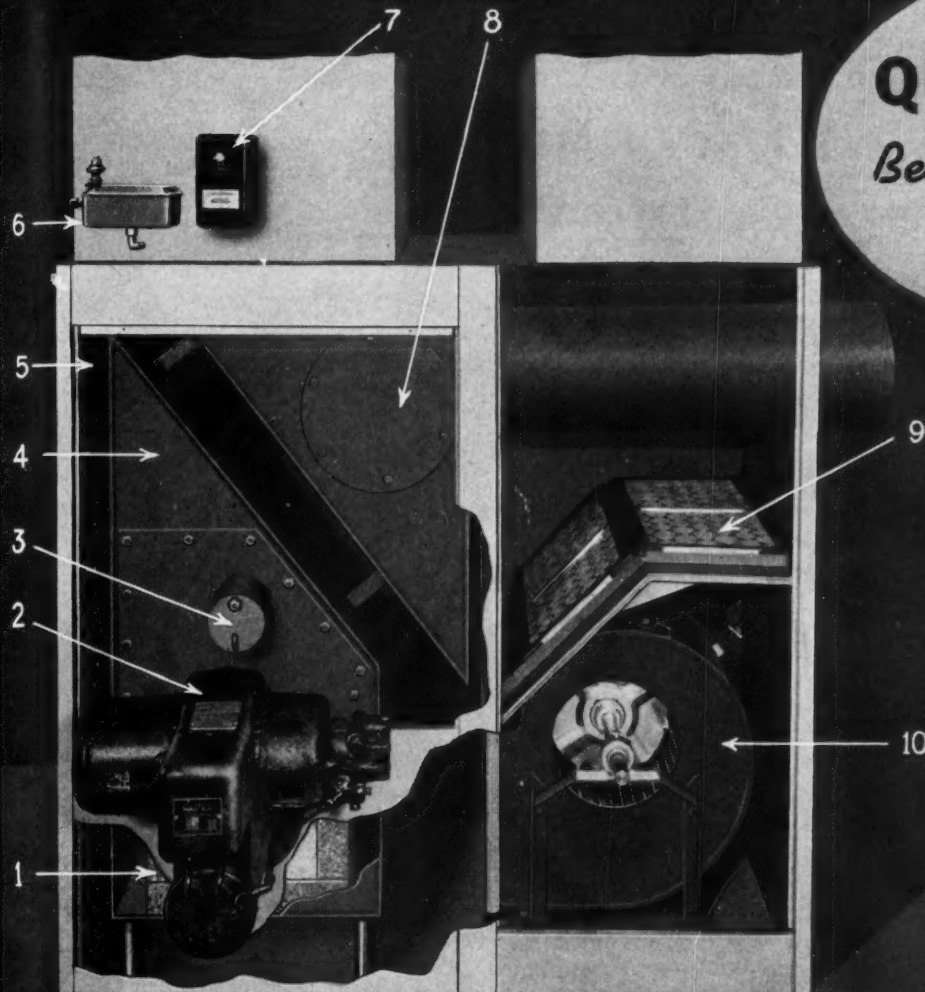
1. It remains elastic—expands and contracts with castings.
2. Withstands higher temperatures without failure.
3. Will not shrink, crack, bloat, or blister.
4. Can be fired immediately; can even be applied to hot metal.

Stocked by leading jobbers everywhere in 1, 5, and 10 lb. cans, and 50 and 100 lb. drums.

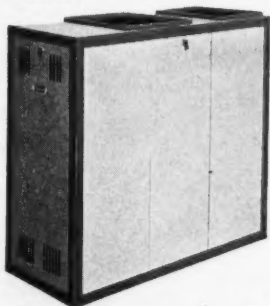


New Air Conditioner COSTS LESS

But
QUALITY IS TOPS
Because Made Complete by
FLUID HEAT



Inside Story of the Fluid Heat FHA Air Conditioner This cut-away view shows the internal construction of the Fluid Heat FHA Air Conditioner. This 80,000 B.T.U. unit is built both with enclosed oil burner as shown in illustration below or with external oil burner as in this cut-away view above.



Easy On The Eyes—Easy To Sell The trim, sharp lines of this amazing new unit clinches sales for builders. Mail the coupon for the facts on this Air Conditioner. Find out about Fluid Heat's complete line of Air Conditioners to solve every home heating problem.

- 1 SECTIONAL COMBUSTION CHAMBER** of special Fluid Heat material.
- 2 FLUID HEAT OIL BURNER.** Exceeds industry standards established by the government. "World's Economy Champion."
- 3 OBSERVATION PORT.** Very handy when adjusting fire at point of greatest efficiency.
- 4 EXCHANGER OF HEAVY STEEL.** To insure added years of service the metal is extra thick on the primary heating surfaces.
- 5 EFFICIENT INSULATION** prevents loss of heat through jacket, keeps outside surfaces cool.
- 6 NON-RUSTING HUMIDIFIER** is mounted inside plenum chamber.
- 7 COMBINATION FAN & LIMIT CONTROL.** Keeps furnace from overheating in winter. Provides air circulation in summer.
- 8 CLEAN-OUT OPENING** is sealed with gas-tight asbestos gasket.
- 9 FILTERS OF SPUN GLASS** effectively scrub the air clean of dust, lint, etc.
- 10 QUIET BLOWER** draws return air from inside house through filters, forces it around furnace and humidifier to provide air circulation in house.

Why be high bidder on small-home jobs? There's no need to lose any of this profitable business. For Fluid Heat gives you a new Air Conditioner, sized and priced to put you ahead of competition. Together with Fluid Heat Oil Burning Hot Water Heaters, it enables you to specify a modern, low cost heating system for every type of small home.

Designed and built entirely by Fluid Heat engineers, this 80,000 B.T.U. Anchor Air Conditioning unit hits a new low price for a quality air conditioner. Here's the first air conditioner ever equipped with a high pressure burner that burns as little as .7 g.p.h. efficiently. An air conditioner that's smartly styled, appealing to the eye.

Complete in every detail, the Fluid Heat FHA offers features found in no other similarly priced air conditioner. Combination fan and limit control switch, rust-proof humidifier, draft regulator, built-in combustion chamber, ample filter area, quiet blower, famous Fluid Heat pressure burner, "the World's Economy Champion." Its uniform air flow eliminates hot spots in exchanger, utilizes all available heating surfaces. Exchangers of copper-bearing steel assure longer life and freedom from corrosion. Finish is baked by a new infra-red method. Design is gas-tight. Exchanger is welded into one piece and clean-out covers are held gas-tight by asbestos gasket.

It's designed for top efficiency and yet its price is right because production costs are kept to a minimum. We buy steel in car-lots from a mill just five miles from our own large, modern plant. The steel is delivered to our own siding, unloaded by electric cranes, carried by electric platform trucks direct to the most modern fast-working metal forming machines. Line methods are used in production. Thus, expensive handling and shipping costs are eliminated.

Read on this page about the unparalleled features of the new Fluid Heat FHA Air Conditioner. Get more information about it. Let us send you the complete story of this remarkable new unit and the entire Fluid Heat line of Air Conditioners. Mail the coupon below—right now—for full details.

MAIL COUPON TODAY

Fluid Heat Division
Anchor Post Fence Co.
6722 Eastern Avenue, Baltimore, Md.

Gentlemen:
I'd like complete information at once on your New Fluid Heat Air Conditioner.

Name

Address

City State

fluid heat
FURNACE UNIT

"World's Economy Champion"

A PRODUCT OF THE ANCHOR POST FENCE COMPANY, BALTIMORE, MD., ESTABLISHED 1892



WE NEVER TIRE
OF HEARING YOU
SAY "Rush!"

1. An order for power-house repairs was telephoned to our Pittsburgh Warehouse at 8:00 o'clock one morning.
2. The order was for about 13 tons of plates and the customer, being in dire need, was greatly excited and worried.
3. A truck was loaded at once and the order arrived at destination, 46 miles from Pittsburgh, at 12:45 P. M.—just 4¾ hours after order was phoned.

YOU can depend upon cheerful as well as prompt service from Scully. The word "rush" is music to our ears, because that's the spirit of our business and the symbol of Scully Service. Our customers always want quick service—even when there's no real *emergency*. So each of the eight Scully Warehouses operates on the basis that you always need your orders in a hurry . . . and we

always hurry whether you ask us or not.

Why not see for yourself why Scully Service is famous? The next time you need steel, steel products, copper or brass—call Scully—the warehouse nearest you will spring into action.

And if you don't have a copy of our handy Stock List and Reference Book, ask for one. The 1940 edition is more complete than ever. And it's free, of course.

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at CHICAGO • NEWARK, N. J. • ST. LOUIS • BOSTON
ST. PAUL-MINNEAPOLIS • CLEVELAND • PITTSBURGH • BALTIMORE

UNITED STATES STEEL

**Scully
Service**

The Mark of Service

ALLOYS
ANGLES, HOT ROLLED and COLD ROLLED
ARCHES (CORRUGATED)
BABBITT
BANDS and HOOPS
BARS, HOT ROLLED
ALLOYS (HR and CF)
COLD FINISHED
ELECTRIC HIGH CARBON STEEL REINFORCING
BEAMS and C. B. SECTIONS
BEEF RAIL
BOLTS, NUTS, WASHERS, ALL KINDS
BORING and TURNING BARS and GRINDERS
BRACES, BOILER
CHAIN, ALL KINDS
CHANNELS
CHISELS
CHUCKS, STAYBOLT
CLAMPS, BOILERMAKERS
CLIPS, PATTERSON
CLEANERS, FLUE
CONDUCTOR PIPE
COPPER and BRASS
COUPLINGS, HOSE
CRAYONS, SOAPSTONE
CUTTERS
DARDELET RIVET and MACHINE BOLTS
DRILL RODS
EAVE TROUGH and FITTINGS
EXPANDERS, FLUE
FERRULES, COPPER
FLANGES, BOILER and TANK
FLOOR PLATES
GALVANIZED SHEETS, BARS, BANDS
HANDLES, HAMMER
HEADS, TANK and FLANGE
HOISTS, HAND and POWER
IRON, STAYBOLT
LUGS, BOILER, TANK and SILO
MACHINERY, HAND and POWER
MANHEAD PLATES and FITTINGS
NAILS
PACKING
PAINT STICKS
PLATE STEEL, STANDARD QUALITIES
ABRASION RESISTING
COR-TEN and MAN-TEN
PLUGS, FLUE
RAILS and FITTINGS
REAMERS
SHAFTING
SHEETS
ABRASION RESISTING
ELECTRICAL
COR-TEN and MAN-TEN
HOT ROLLED and UNIFORM BLUE
WELLSVILLE POLISHED
COLD ROLLED
STAINLESS STEEL
GALVANIZED and GALVANNEALED
LONG TERNE
CORRUGATED
U-S-S COPPER STEEL
SPRING STEEL BARS and SHEETS
STAINLESS STEEL
STRIP STEEL, CR and HR
TEES
TIRE, ROUND EDGE
TOOLS, HAND and POWER
for BOILER and IRON WORK
TROLLEYS
TUBES, BOILER
TURNBUCKLES
VALVES, BLOW-OFF
WELDING ROD and WELDERS
ZEES

The Mark of Quality





NORGE

OIL HEAT

at 5% to 8%
of the cost of
Homes selling
for \$2000 up!



NORGE Model OB-60 FASTEMP FURNACE, for example, can be installed in a \$2000 home for about the price of a good "parlor heater," yet it gives the home owner modern oil heat with a wall control and semi-automatic operation, heat delivery to two rooms and cold air returns from exposed spaces.

This Norge unit is absolutely revolutionary in its excellent quality, low cost, high efficiency, economy and compactness—and it is just one example of the great values that Norge is building into every Norge heating unit.

Here's a condensed list of Norge Package Heating Units:

MODEL 120 WINTER AIR CONDITIONER; low first cost, fully automatic, set up in 2 to 3 hours, factory wired, mechanical draft, forced filtered air, humidity, 120,000 B.T.U. at bonnet, single motor, 85% to 87% efficiency, oil or gas, basement or utility room.

MODEL OA-63 FASTEMP FURNACE; 63,000 B.T.U., utility room, basement or pit installation. 800 C.F.M. forced air, Evenheat Wall Control, an oil-burning, central heating plant at less than the cost of an old-fashioned furnace.

MODEL OB-60 FASTEMP FURNACE; 60,000 B.T.U. gravity; basement or pit installation.

MODEL OC-60 FASTEMP FURNACE; 60,000 B.T.U. gravity floor furnace, needs only 40" pit under floor.

These four package units cover 90% of the entire heating and air conditioning market—and at unbelievably low prices. Write or wire for literature, prices and details of many new performance and durability features.

NORGE HEATING and CONDITIONING DIVISION
BORG-WARNER CORPORATION DETROIT, MICH.



Model OA-63
Fastemp Furnace



Model 120
Winter Air Conditioner



Model OC-60
Fastemp Furnace

Date _____

Norge Heating and Conditioning Division
Borg-Warner Corporation
670 East Woodbridge St.
Detroit, Michigan

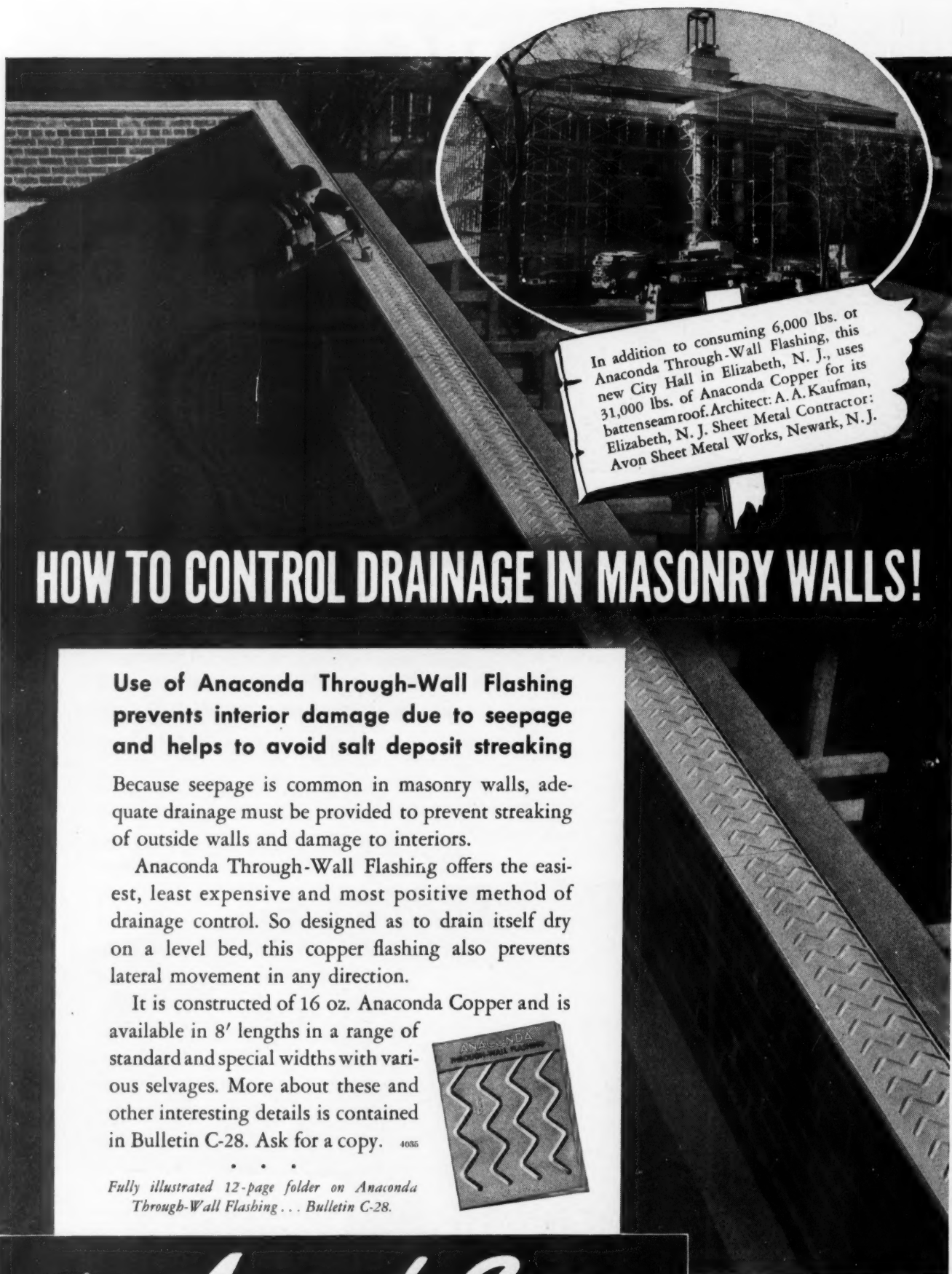
RUSH me information about your line of heating equipment.

Name _____

Address _____

City _____ State _____

AA-115



In addition to consuming 6,000 lbs. of Anaconda Through-Wall Flashing, this new City Hall in Elizabeth, N. J., uses 31,000 lbs. of Anaconda Copper for its battens seam roof. Architect: A. A. Kaufman, Elizabeth, N. J. Sheet Metal Contractor: Avon Sheet Metal Works, Newark, N. J.

HOW TO CONTROL DRAINAGE IN MASONRY WALLS!

Use of Anaconda Through-Wall Flashing prevents interior damage due to seepage and helps to avoid salt deposit streaking

Because seepage is common in masonry walls, adequate drainage must be provided to prevent streaking of outside walls and damage to interiors.

Anaconda Through-Wall Flashing offers the easiest, least expensive and most positive method of drainage control. So designed as to drain itself dry on a level bed, this copper flashing also prevents lateral movement in any direction.

It is constructed of 16 oz. Anaconda Copper and is available in 8' lengths in a range of standard and special widths with various selvages. More about these and other interesting details is contained in Bulletin C-28. Ask for a copy. 4035



Fully illustrated 12-page folder on Anaconda Through-Wall Flashing . . . Bulletin C-28.

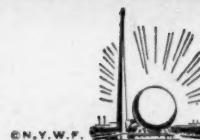


Anaconda Copper

THE AMERICAN BRASS COMPANY, General Offices: Waterbury, Conn.

In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

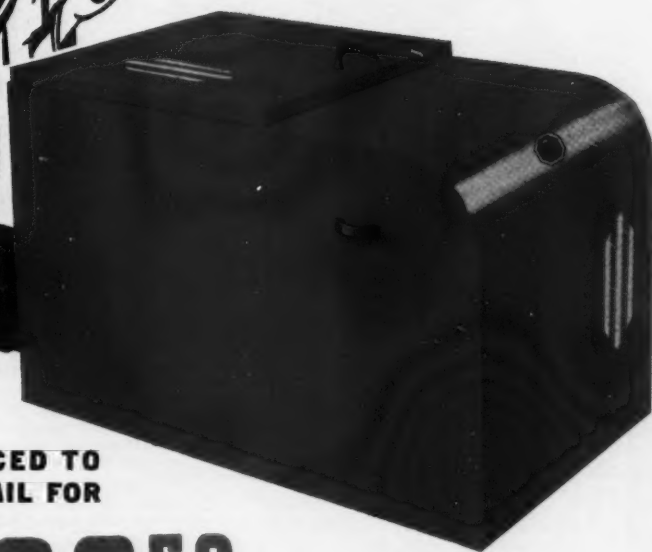
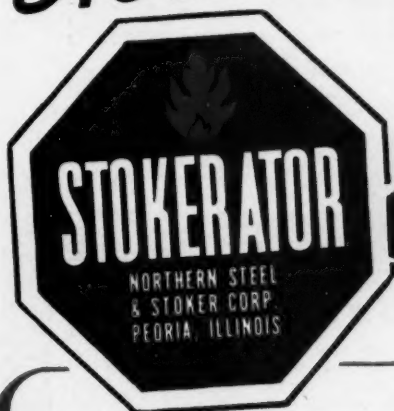
Subsidiary of Anaconda Copper Mining Company



Visit the Copper & Brass Industry Exhibit in the Hall of Industry, New York World's Fair, 1940

*Somebody
Had to Offer a **FULL SIZED,**
QUALITY Stoker at a Price
to Make Millions Buy*

Here it is!



Compare THESE GREAT STOKERATOR FEATURES

GE MOTOR—totally enclosed, with automatic overload cut-out.

CONSTANT SPEED TRANSMISSION—Highest efficiency. No pawl or ratchet. Accepted by engineers as finest for stoker use.

HEAVY CAST IRON HOPPER-BASE—Provides unusual durability, smooth performance.

LIFETIME VANADIUM STEEL SCREW—tapered. Finest vanadium alloy—heat-treated for long life. Requires less power.

AUTOMATIC AIR DAMPER CONTROL—Maintains fuel bed at highest efficiency. New air muffler built-in—eliminates 90% of the noise.

SECTIONAL TYPE RETORT—new perfected design, made of the highest heat-resisting alloys. Greatest efficiency.

MINNEAPOLIS - HONEYWELL CONTROLS—proof of highest quality.

PRICED TO
RETAIL FOR

\$129⁵⁰

*with Minneapolis-
Honeywell Controls!*

PLUS INSTALLATION

LET'S face facts! You sell the IDEA of automatic coal heat—and somebody with a better price sells your prospects a stoker. Why not get in a position to beat competition? It's easy with STOKERATOR!

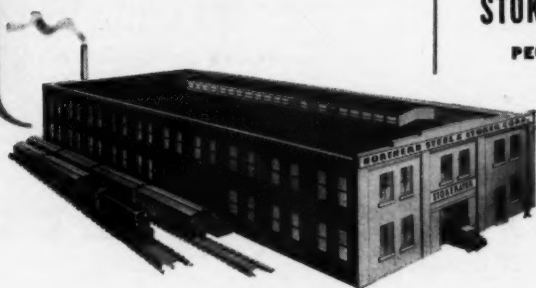
STOKERATOR is a high-quality, guaranteed line, backed by 15 years of expert stoker engineering and build-

ing. STOKERATOR offers ALL the features your prospects want. Get into the BIG stoker market—the average home! STOKERATOR facts will amaze you!

STOKERATOR models available for every home and building. Write or wire at once for full details about the profitable STOKERATOR proposition and Sales Helps.

**NORTHERN STEEL &
STOKER CORPORATION**

PEORIA • ILLINOIS



*"Sooner or later,
you'll have
STOKERATOR"*

CLIP TO LETTERHEAD
NORTHERN STEEL & STOKER CORP.
3100-42 Prospect Road
Peoria, Illinois
Gentlemen:

Yes! You may send me full information and facts on STOKERATOR. No obligation.

NAME

CITY

☐ Distributor
☐ Dealer
☐ Manufacturer
(check which)

HERE'S YOUR BASE OF SUPPLY FOR ARMCO

Stainless



Once known as the "metal of a 1001 uses," stainless steel is rapidly going beyond that impressive mark. Many of these "uses" are right down your alley. They represent jobs you can do at a handsome profit. Find your nearest ARMCO Stainless Distributor on this list and ask him to help you get started on this money- and reputation-making business. He not only is a reliable source of supply, but a good sales- and fabricating advisor as well. The American Rolling Mill Company, 2251 Curtis Street, Middletown, Ohio.

ARMCO Stainless Distributors

ATLANTA, GEORGIA
Conklin Tin Plate & Metal Co.
BALTIMORE, MARYLAND
Arnold & Co.
BIRMINGHAM, ALA.
The George F. Wheelock Co.
BOSTON, MASS.
Brown-Wales Co.
Herrick Company
Industrial Steels, Inc.
BRIDGEPORT, CONN.
Chapin & Bangs Co.
BROWNSVILLE, TEXAS
Alamo Iron Works
BUFFALO, N. Y.
Brace-Mueller-Huntley, Inc.
J. M. & L. A. Osborn Co.
CAMBRIDGE, MASS.
Industrial Steels, Inc.
CHARLOTTE, NORTH CAROLINA
Horne-Wilson, Inc.
CHICAGO, ILLINOIS
Central Steel & Wire Co.
CINCINNATI, OHIO
Central Steel & Wire Co.
The Edwards Mfg. Co., Inc.
CLEVELAND, OHIO
Bissett Steel Co.
J. M. & L. A. Osborn Co.
COLUMBUS, GEORGIA
Columbus Iron Works
COLUMBUS, OHIO
F. O. Schoedinger
DALLAS, TEXAS
Huey & Philp Hardware Co.
Monierief-Lenoir Mfg. Co.
DAYTON, OHIO
Central Steel & Wire Co.
DETROIT, MICH.
Copper & Brass Sales Co.
J. M. & L. A. Osborn Co.

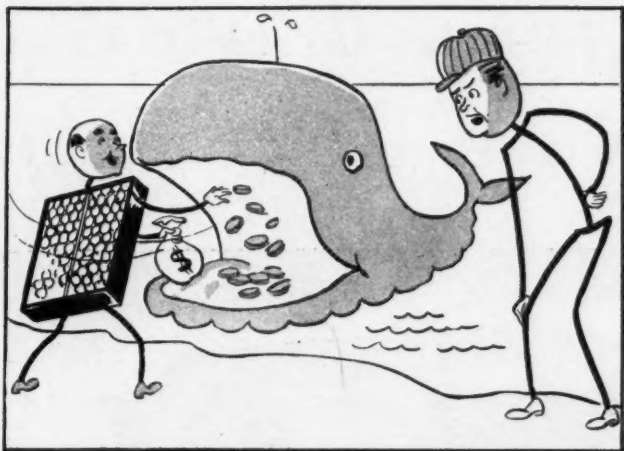
FALL RIVER, MASS.
The Congdon & Carpenter Co.
FORT WORTH, TEXAS
Maxwell Steel Co.
Monierief-Lenoir Mfg. Co.
GRAND RAPIDS, MICH.
Behler-Young Company
GREENSBORO, N. C.
Carolina Steel & Iron Co.
HARTFORD, CONN.
Blodgett & Clapp Co.
HOUSTON, TEXAS
Monierief-Lenoir Mfg. Co.
INDIANAPOLIS, INDIANA
W. J. Holliday & Co.
JACKSONVILLE, FLA.
Horne-Wilson, Inc.
KANSAS CITY, MO.
Metal Goods Corp.
Richards & Conover Hdwe. Co.
KNOXVILLE, TENN.
C. M. McClung & Co.
LACROSSE, WIS.
Badger Corrugating Co.
LOUISVILLE, KY.
Conner Mfg. Co.
LOS ANGELES, CALIF.
Electric Steel Foundry
LUBBOCK, TEXAS
Monierief-Lenoir Mfg. Co.
MEMPHIS, TENN.
Pidgeon-Thomas Iron Co.
MIAMI, FLA.
Horne-Wilson, Inc.
MILWAUKEE, WIS.
Shadbolt & Boyd Co.
NASHVILLE, TENN.
Phillips & Butterff Mfg. Co.
NEW ORLEANS, LA.
Orleans Steel Products Co.
NEW YORK (METROPOLITAN)
JERSEY CITY, N. J.
York Corrugating Co.

NEWARK, N. J.
Edgecomb Steel Corp.
Mapes & Sprowl Steel Co.
OKLAHOMA CITY, OKLA.
Richards & Conover Hdwe. Co.
PHILADELPHIA, PA.
Edgecomb Steel Co.
PITTSBURGH, PA.
Follansbee Brothers Co.
PORTLAND, OREGON
Jacobs & Gile, Inc.
PROVIDENCE, R. I.
Congdon & Carpenter Co.
RICHMOND, VA.
Gordon Metal Co.
ROCHESTER, N. Y.
Brace-Mueller-Huntley, Inc.
Follansbee Brothers Co.
ROCKFORD, ILLINOIS
America Heating & Supply Co.
ST. LOUIS, MO.
Metal Goods Corp.
E. E. Souther Iron Co.
SAN ANTONIO, TEXAS
Alamo Iron Works
Monierief-Lenoir Mfg. Co.
SAN FRANCISCO, CALIF.
Gilmore Steel & Supply Co.
SAVANNAH, GA.
Conklin Tin Plate & Metal Co.
SHREVEPORT, LA.
J. B. Beaird Corporation
SPRINGFIELD, MASS.
Warren F. Hoye, Inc.
SYRACUSE, N. Y.
Brace-Mueller-Huntley, Inc.
TAMPA, FLORIDA
Horne-Wilson, Inc.
TOLEDO, OHIO
C. F. Thom & Sons Co.
VANCOUVER, CANADA
McLennan, McFeely & Prior, Ltd.
WASHINGTON, D. C.
York Corrugating Co.

ARMCO

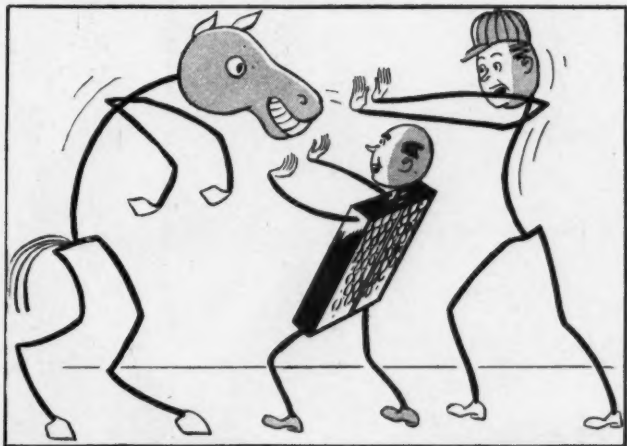


STAINLESS STEEL



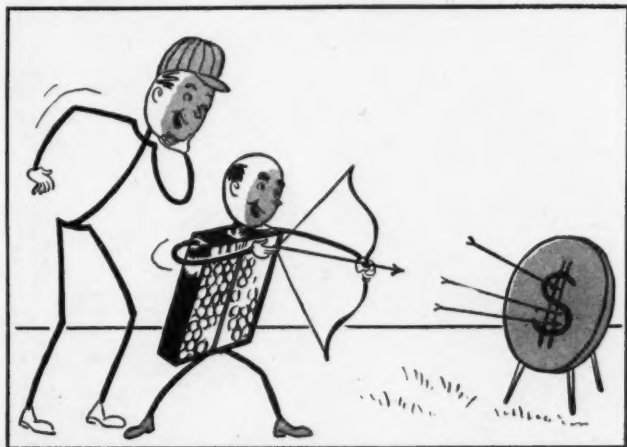
DUST-STOP MAN: I tell you, Ed, you're simply throwing away money on your forced warm-air furnace installations—even in this summer weather.

ED: How come, little fella? How come?

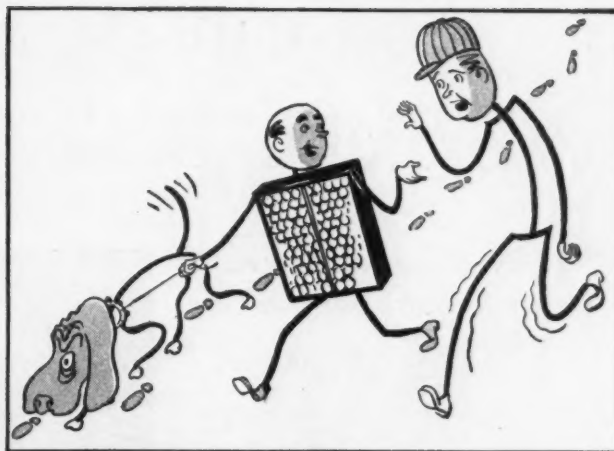


DUST-STOP MAN: Wrong, Ed. Dead wrong. You can't hold back your customers from buying with a team of horses. Provided you do a couple of things.

ED: Oh yeah? What's the catch?



DUST-STOP MAN: You ask your Dust-Stop jobber for a **FREE** Dust-Stop sales portfolio... and **FREE** postcards... and **FREE** mailing pieces... and **FREE** newspaper mats... and **FREE** filter-change labels... and...



DUST-STOP MAN: Because you haven't even started to sniff out replacement business on Dust-Stop® Air Filters.

ED: What's the use? My customers don't even know they've got filters. Much less that they should change 'em.



DUST-STOP MAN: What d'ya mean "catch"? The makers of Dust-Stop Filters just brought out the *biggest and best set of dealer helps ever offered in the air filter field.*

ED: Say! That's pretty swell news! What do I do?



ED: Whoa! That's enough! Boy, am I going to dig out customers for Dust-Stops now. And what's more, if I get in their homes to sell 'em Dust-Stops, they'll probably buy some of my other services, too. Thanks, little fella, for the tip on how to get a lot of extra profits.

FIBERGLAS* DUSTOP* AIR FILTERS

*T. M. REG. U. S. PAT. OFF.

Made by Owens-Corning Fiberglas Corporation, Toledo, Ohio

DIRECT CANADIAN INQUIRIES TO FIBERGLAS CANADA, LIMITED, OSHAWA, ONTARIO

You can cut Service Costs with this Penn-Built Stoker Timer Relay

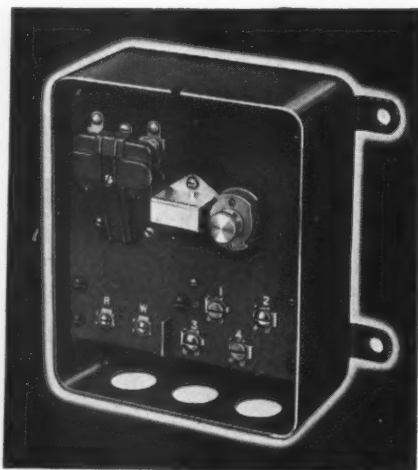
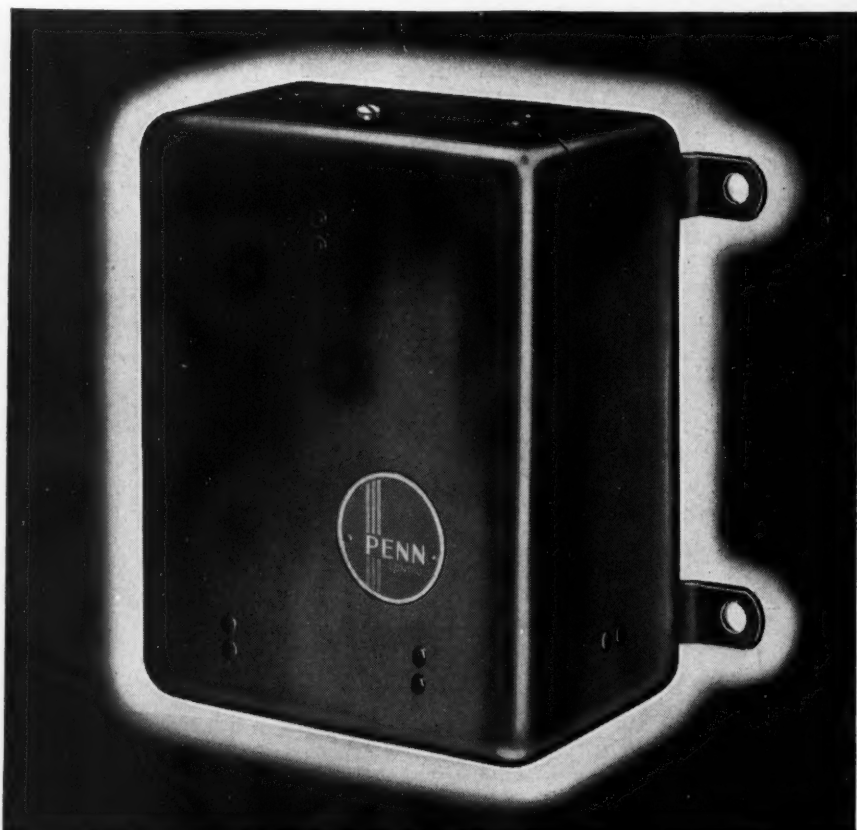
Claim Based on Accurate Dealer Records—but You Can Prove It Yourself

Years of service have demonstrated one outstanding feature of Penn Type 560 Stoker Timer Relays—their record for long time, attention-free performance.

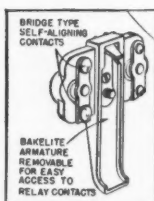
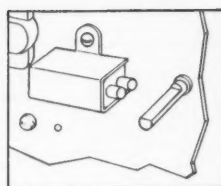
Ask the dealers who are in a position to compare several years of accurate service cost records on other stoker timers as well as Penn. They will tell you, "Service calls are practically nothing with Penn-Built Stoker Timer Relays."

There's a reason. This compact, sturdy stoker timer relay is designed and built to "take it"—month after month. The record of three years of field service on all types of heating plants and with all types of fuel proves it. Examine a few of the features of the Penn Type 560 Stoker Timer Relay at the right, below. Better yet, put one on an operating trial under actual field conditions. Find for yourself why users are so well satisfied.

Penn Electric Switch Co., Goshen, Indiana.
In Canada: Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ont.
Export:—100 Varick Street, New York City.
Branches, representatives and distributors in all principal cities.



Snap-acting hold-fire contacts contribute to quiet operation... long relay life... trouble-free performance. Protected by sturdy metal guard. Available with thermostat interlock on special order.

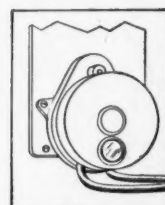


Relay, rated for 1 H.P. load, possesses greater pull-in and hold-in power than competing units for similar service. This contributes to long life of the electrolytic silver relay contacts... assures the positive contact action that reduces wear on stoker and operating parts. Bridge type contacts eliminate flexible leads.



Sealed, synchronous, self-starting electric timer motor. Permanently self-lubricating. Quiet. Sturdy. Generous reserve power.

Standard timer cam is quickly adjustable in the field for firing every hour or every half hour... 1 to 10 minute firing period.



Other features of Penn Stoker Timer Relays include: Minimum of operating parts. Generous wiring space. Rubber mounting feet.

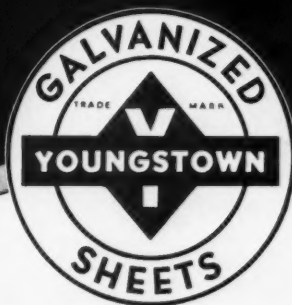
More information on what Penn Controls will do for you—One of a Series.

PENN

Penn-Built Controls for Many Applications

Thermostats, Bonnet Controls, Ductstats, Fire Protection Controls, Water Temperature Controls, Boiler Pressure Controls, Boiler Water Level Controls, Humidistats, Stack Switches, Stoker Timer Relays, Solenoid

Gas Valves, General Purpose Relays, Solenoid Refrigerant and Water Valves, Refrigeration Pressure and Temperature Controls, Water Valves, Pump Controls, Air Compressor Controls, Air Volume Controls, Line Starters.



48 1/3 TONS OF WATER..

PER SQUARE FOOT OF DUCT PER YEAR

That's why air conditioning jobs need the corrosion resistance of Youngstown's Galvanized Sheets.

No one regrets the passing of the old hot air jobs--but they had one advantage--the air in them was practically bone dry and virtually non-corrosive to duct work. Modern air conditioning has increased the corrosion problem in sheet metal ducts many times.

Because your reputation depends on the service your duct jobs give, you will need the quality that Youngstown builds into every Youngstown Galvanized Sheet. Made by expert steel men, the base metal in Youngstown's Galvanized Sheets is outstanding for its uniform ductility. In the galvanizing process, Youngstown's modern manufacturing procedures assure a positive adherence and a uniform thickness of corrosion-resistant

Youngstown Sheets not only offer a solid wall of zinc to resist corrosion but their uniform workability helps your men to faster time and better workmanship.

★ This figure is based on a normal cooling job with air leaving the coils at 85% saturation -- 55° dry bulb temperature, 4.7 grains moisture per cubic foot of air and duct velocities averaging 1000 f.p.m.--for 8 hours a day and 300 working days per year.

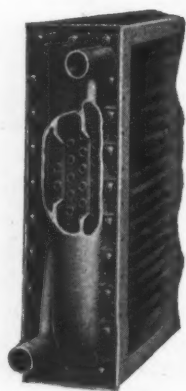
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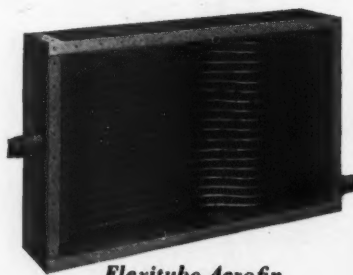
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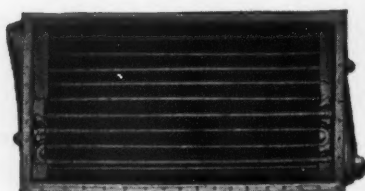
Heat Exchange Surface



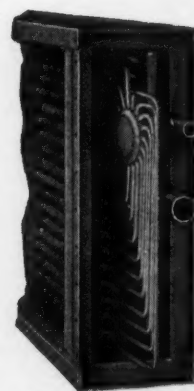
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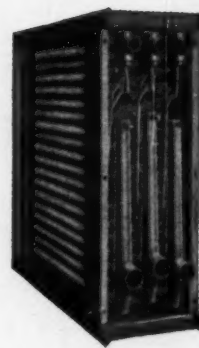
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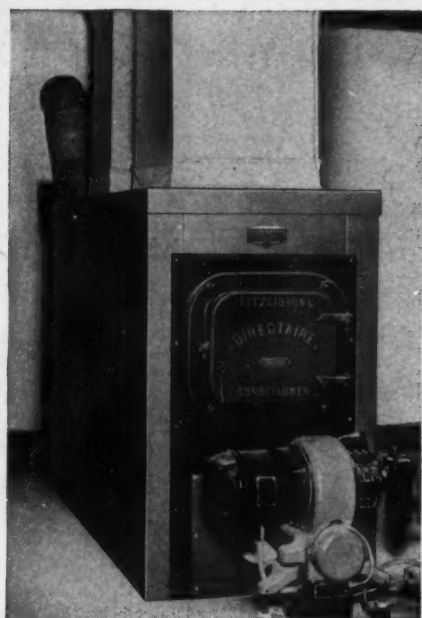
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Steel is essentially a peacetime industry—and America's normal appetite for steel is great.

This is fortunate for all of us.

It permits steel producers to carry on year after year and to find employment for hundreds of thousands of men.

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Attic Fan Sales in 1940

IN this issue we bring to a close the series of articles published during the summer describing the attic fan sales programs of dealers here and there around the country. This reminds

us that we have published a series of articles on attic fans—night air cooling each year—without interruption—since the summer of 1934 when we reported the first Research Residence tests.

Coincidentally, as Mr. F. G. Sedgwick pointed out in his Research Advisory Committee report last June, our industry made the first tests, solved the first problems and launched the attic fan industry.

In these years we have been publishing articles dealing with attic fans, we have covered several times the complete story of the underlying engineering principles of this science of cooling by air movement. Surprising enough, very little has been added through the years to the basic engineering information first tested and described by our Research Residence. The Research Residence staff did a thorough job.

About the only furthering research which has been made since has dealt with means to remove mechanical vibration and methods to eliminate air noise. These improvements in technique we have reported fully and faithfully.

Meanwhile, what has happened to attic fan sales? Down south, as everyone knows, attic fan sales have boomed. Some cities have bought thousands of fans. Dealers doing nothing else have sprung up to meet the demand. Every conceivable size, type, and construction of fan has been placed on the market. Prices have slid downward. Up north, attic fan sales are still lagging. Here and there an individual dealer has made a phenomenal showing, but by and large, attic fan business "up north" still remains a "greener field" which has only been prospected.

What will be the ultimate outcome, we do not profess to know. Even now changes which may be portentous are coming. For instance we report the trend from attic fans to window fans in

New Orleans in this issue. And, also in this issue, something about the trend to evaporative coolers in cities where this method of cooling was considered visionary a short time ago.

We do know that our industry launched an idea which has been beneficial to tens of thousands of home owners. Our dealers and others have made the most of the idea within each individual's capabilities. What eventually becomes of the idea, and when, remains to be seen.

Getting Back to Fundamentals

READERS probably have noted that issues since late last year have carried a number of articles on copper roof failures. Contractor Gichner of Washington, D. C., and Engineer Car-

ter Cole of the Copper and Brass Research Association have "authored" these reports. We have not "picked on" copper to in any way decry copper as a roofing material, but we have published these reports because the construction world looks on copper as the ultimate in roofing material and something has gone wrong with our assumptions.

What has gone wrong can be summarized in a few words.

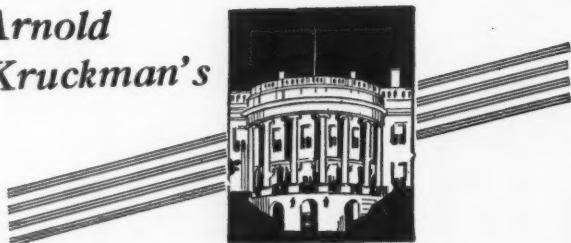
The contractors have not laid copper roofs according to the recommendations which have been standard construction for many years.

This failure to follow fundamentals has been due to two reasons. First—price cutting has necessitated "cutting corners." Secondly—many contractors have laid copper roofs in ignorance of the results of failure to follow standard construction or because they just won't believe the facts the industry has so painstakingly worked out.

In either case, a perfectly good material—a material proved by generations of time—has been getting a black eye and something should be done about it.

We hope to do something by showing pictorially what happens when a contractor employs poor practice. Every contractor who hopes to make a

(Continued on page 115)



Washington Letter

HOUSING and other building construction planned and programmed as part of the national defense totals a gross expenditure of more than \$6,400,000,000, according to conservative official estimates. Cash and credit have been provided for this work, and it is expected to be chiefly done during the period ending with June 30, 1942. Upwards of a billion either has been provided or is in process of being provided for housing. The rest, something over \$5,000,000,000, will be spent on buildings and structures planned for the national defense.

Buildings for National Defense

Specific plans have either been dusted off and renewed, or are being prepared, for dwellings, munitions plants, armor-plate works, aluminum plants, waterworks, electric plants, hangars, office buildings, loading plants, powder plants, armories, officers' quarters, barracks, hospitals, radio stations, arsenals, public buildings, aircraft factories, ordnance plants, navy yards, shipyards, laboratories, railway stations, docks, quays, forts, ordnance depots, naval training stations, engineering equipment stations, U. S. Coast Guard depots, Quartermasters depots, military factories, cantonments, air training stations, naval operating bases, marine bases, fuel depots, submarine bases, marine supply depots, utility systems, air bases, schools, churches, ammunition depots, torpedo stations, and other buildings and structures. This list was taken from various official listings by the Army and Navy.

The housing, if present plants are maintained, will principally be built under supervision of the United States Housing Authority. HR 9822, now law, definitely names the USHA as the boss of the housing projects to be built for families of enlisted men of the Army and Navy, for civilians employed by the Army and Navy, and for the civilians hired in any industry working on national defense. USHA not only is authorized to plan, but to furnish ALL funds, to operate the projects, and to

coordinate these plans and purposes with the Army and Navy.

USHA works through local housing authorities in all States except Iowa, Kansas, Maine, Minnesota, Nevada, New Hampshire, Oklahoma, South Dakota, Utah and Wyoming. These States have no local housing authorities, and the USHA will operate there directly as banker, planner, broker, supervisor, and agent. It has already begun to work on national defense housing projects in a dozen communities. Where there are local authorities, contracts are made by the local organization, under Federal conditions; elsewhere contracts are made directly by the USHA.

Who Runs the Program

The huge undertaking is immediately under the direction of Assistant USHA Administrator Jacob Crane, with the assistance of L. M. Cox, both resident in Washington, and easy to see. There are signs, however, that USHA will not hold its place as czar of defense housing without a fight. The other Government housing agencies including FHA, FWA, HOLC, FSA, and the many farm and suburban home building agencies, are definitely opposed to the arrangement, and have already begun to record their opposition. This opposition is reflected in the National Defense Advisory Committee which passes out the word that ALL Government agencies interested will have a hand in the building of housing and other structures.

This is interpreted, in Washington, to mean that forthright direct action will be delayed until the conflict among the agencies is settled. It will be the job of Charles F. Palmer, of Atlanta, to try to act as housing coordinator under National Defense Committeeman Knudsen. Under Mr. Palmer there is J. C. Nichols, of Kansas City, one of the nation's large building operators, who has been placed at the head of the Miscellaneous Materials Division, which includes sheet metal work, heating and air conditioning. Other building construction for the national defense comes under the supervision of W. H.

Harrison, vice-president of the A. T. & T.

Frankness imposes the obligation to report that Washington regards the National Defense Advisory Committee work as yet a mess. The situation is not the fault of the fine group of men who are on the job. It is the fault of the anomalous arrangement. The National Defense Advisory Committee does NOT place orders and does NOT make contracts. It is solely and only a clearing house. It acts as the President's broker and umpire and fixer. It has no power or authority. It exists purely by sufferance of the President. He can wipe it out at a moment's whim. It can enforce its suggestions only by the influence of its prestige.

Holding its nebulous power only by the will of the President, it has no relation to Congress. It tries to spur greater supply of the things that are short; it tries to prevent Government agencies from bidding against each other; it allocates priorities among Government agencies as well as among industries and labor.

But the real making of contracts and the giving of orders, still is vested in the same agencies, such as the Navy Bureau of Yards and Docks, the Bureau of Engineering, the Bureau of Supplies, the Bureau of Construction and Repairs, the Army Quartermaster, the U. S. Army Engineers, and other military and civil agencies, well known to those who do business with the Federal Government.

Air Conditioning Specified

Air conditioning, in its simplest forms, will be installed in the housing built by the USHA. The USHA runs solely to the attic fan and its equivalents for cooling. Other agencies, whether they build apartment houses, or single-family dwellings, usually utilize mainly the attic fan. Air conditioning of the most modern type will be installed in munition plants, whether the plant is built for operation by the Government or by private industry. Almost any plant that makes munitions has been planned for air conditioning. Airplane factories and airplane engine factories will be air conditioned. All factories, large or small, that make machinery or tools, will be air conditioned; and all plants, whatever their size, that make fabrics or manufacture fabrics, leathers, medicines, fine instruments, foodstuffs, must be air conditioned. All hospitals and laboratories will be air conditioned. All public buildings and office buildings erected for Government use will be air conditioned. If FDR had his way every factory and every place in which men and women work for the national defense would be air conditioned to maintain health and morale. The Navy even is air conditioning battleships, gun turrets, and bombing planes.

(Continued on page 119)

AMERICAN ARTISAN

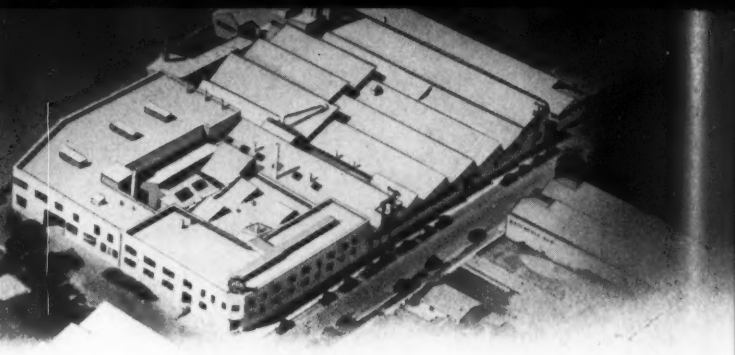
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1 SECTION



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

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LIKE AN AIRPLANE ENGINE

Cast-Iron Heating Element Finned and Streamlined for Faster, Better Radiation

Sectional, Self-Contained Heating Elements Provide a Very Flexible Range of Capacities

Where heavy duty operation, durability, safety and efficiency are required, specify "Pacific" Everlast Furnaces, gravity or blower type. *The time-tested cast-iron heating element is different. It provides frictionless warm air passages for unrestricted air flow and rapid heat transfer through the finned radiation surface. A wide selection of heating capacities (50,000 B.T.U. to 550,000) are obtained by using sectional construction. Each section has its own heating element, individual venturi-type burner and draft diverter. All joints are machine surfaced so that, when bolted together with heavy asbestos gaskets, they form an integral, gas-tight, leak-proof unit of great strength and durability. Openings between each section give the effect of a continuous combustion chamber. Burners are supplied for either natural or manufactured gas. A wide range of automatic Controls, as approved by the American Gas Association, can be furnished. *Write today for full information on the profitable "Pacific" Everlast Furnaces.



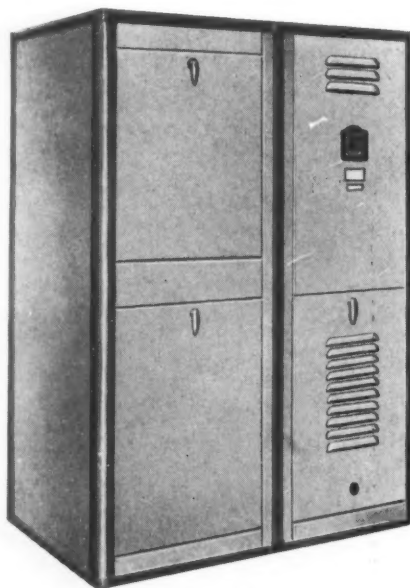
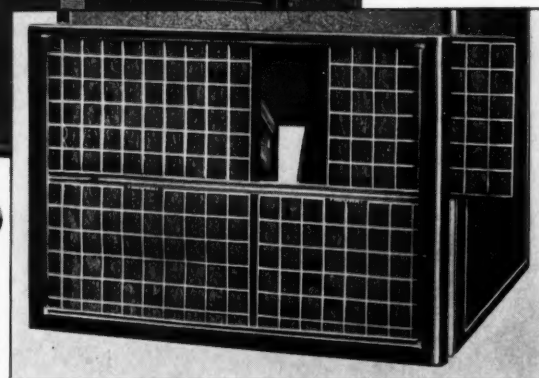
"PACIFIC"
EVERLAST
FURNACE

50,000
TO
550,000
B. T. U.

Below: Rear view
of Air Filters,
looking into Blower
Compartment.



Left:
Photo
of
Cast-Iron
5-section
Everlast
Element.



Sell Comfort de Luxe....Winter Air-Conditioning And Summer Ventilating with "Pacific" A-69

HERE'S a big seller! A winter air-conditioning and summer ventilating unit of utmost efficiency, with a modern case of handsome appearance that invites people to spend a few more dollars for a furnace around which they can remodel their basements into attractive and useful extra rooms. Many new homes are planned with basement playrooms because this beautiful and compact gas furnace is available. *The "Pacific" A-69 is made in a wide range of capacities to care for most heating and ventilating requirements. The Multi-Tubular Burner assures complete combustion of natural, manufactured or liquefied petroleum gases. It has the "Pacific" Round All-Steel Heating Element. The Blower is provided with grease-packed self-aligning ball bearings mounted in rubber pillow-blocks, assuring thorough lubrication and quiet operation. *Write us for all details on this fast-selling forced-air furnace. . . "Pacific" Model A-69.

Right: Blower section
of the A-69,
panel removed to
show Blower and
one of Air Filters.
Below: Multi-Tu-
bular Burner and
Cast-Iron Liner.



Air Conditioning For the Relief of Cedar-Pollen Hayfever* [Part 3]

By Alvin H. Willis and Howard E. Degler

Research Assistant and Professor of Mechanical Engineering
The University of Texas, Austin, Texas

HAYFEVER and asthma were long considered incurable diseases and the patients found relief only by the use of morphine or by travel to "Hayfever Resorts." For this reason physicians paid little attention to the sufferers and many of them became easy victims of quacks and sellers of patent medicines. Now, through the ingenuity of the air conditioning engineer cooperating with the physician, this condition is being changed. The treatment of the "rich man's disease" (as hayfever has been called) is coming within the reach of everyone.

Air Filtration for Relief

The old proven theory that the sufferer could be relieved by travel to a place having a pollen-free atmosphere is also the basis of this new relief. The only modification of this theory is that the traveling has been eliminated, as pollen-free atmospheres can now be produced in the patient's home. This pollen-free atmosphere is available through the use of air-filtering devices. An idea of the success of these devices can be readily obtained from a short study of the experimental results of tests conducted on patients living in the Great Lakes and New England regions.

The group of men who seem to have done the greatest amount of work along the line of Air Filtration for the Relief of Hayfever are T. Nelson, B. Z. Rappaport, and W. H. Welker. They published their experimental work in two papers;⁴ these experiments were undertaken to determine the measure of relief that can be afforded the sufferer with uncomplicated hayfever by placing him in a room supplied with filtered air. They also desired to learn whether comparative freedom from pollen irritation for a portion of the twenty-four hour period would establish reasonable personal efficiency for the remainder of the period. A study of the time element necessary to give relief from pollen asthma and the efficiency of the commercial apparatus for pollen removal was also included.

The following conclusions from the second report on "Further Studies" by the above men gives a very good synopsis of the complete set of tests and results: 1. Experimental and commercial

filters as now manufactured are not 100 per cent efficient for removal of pollen. 2. Air filtration that removes all but traces of pollen will relieve symptoms of hayfever. 3. Symptoms reappear on exposure to pollen-laden air, regardless of length of confinement to filtered air. The time for reappearance of symptoms is inversely proportional to the pollen concentration outdoors. 4. Filtered air, cooled from 8° to 10° F. below outside temperature without dehumidification, does not give as prompt or as great relief from symptoms of hayfever as uncooled filtered air. 5. If patients with pollen asthma are confined in filtered air for a sufficient length of time, their subjective symptoms of asthma will be relieved. The objective evidences of asthma disappear less readily. 6. The length of the primary confinement period in filtered air is determined by the severity of the asthma. 7. Patients with asthma required a longer period of initial confinement in filtered air than those with hayfever. 8. The tolerance period on exposure to pollen varies in the same individual from day to day because of the variation in the pollen concentration outdoors. 9. Confinement in filtered air before the onset of asthma will not prevent its occurrence. 10. In addition to pollen concentration, weather changes are important influences in precipitation attacks of asthma in pollen sensitive patients.

Limitations of Air Conditioning

Dr. C. P. Yaglou, Department of Industrial Hygiene, Harvard School of Public Health, sums up the practical side of the experiments up to 1937 in his discussion on the "Usefulness and Limitations of Air Conditioning Methods in the Control of Allergic Disorders." This was published as part of a paper on the "Application of Air Conditioning to the Treatment of Disease" in *Heating, Piping, and Air Conditioning Magazine*, Vol. 9, p. 635, 1937. In this report he states that the results obtained with air filtration of the air-conditioning processes in the control of allergic conditions are fairly comparable to those obtained by desensitization treatment so long as the patients remain in the pollen-free atmosphere. But

*Engineering Research Series No. 31, The University of Texas, Bureau of Engineering Research. Edited and reprinted by permission.

4. "The Effect of Air Filtration on Hayfever and Pollen Asthma" (*J.A.M.A.* Vol. 98, pp. 1861, 1932) and "Further Studies" (*J.A.M.A.* Vol. 100, pp. 1935-92, 1933).

while specific desensitization is preventative and in a few instances curative for all practical purposes, filtration gives only temporary relief. With rare exception the symptoms recur on exposure to pollen-laden air. Moreover, the usefulness of air-conditioning methods is limited because all cases are not caused by air-borne substances. Cases of bacterial asthma do not respond at all to the treatment with filtered air.

Despite these limitations, air conditioning methods possess definite advantages in simplicity and convenience, and under certain conditions provide almost immediate relief. Hayfever cases are usually relieved of most of their symptoms within an hour after exposure to properly filtered air. In pollen asthma cases relief comes more slowly, usually after an exposure of from 1 to 12 days, depending upon the severity of the asthma.

A pollen-free atmosphere is essentially valuable for patients in whom desensitization has little or no relief, and in instances in which desensitization is not advisable owing to intercurrent illness. On the whole, air conditioning methods are considered to be valuable adjuncts in medical diagnosis and treatment of allergic disorders.

Cedar Pollen Causes Hayfever

Texas and the Southwestern area of the United States have a number of the pollen grasses causing the spring hayfever and the ragweed causing the autumn hayfever. Annually, however, in certain parts of Texas there occurs a winter hayfever. Dr. S. N. Key of Austin, Texas, was apparently the first person to recognize the persistent "colds" of some of his patients as a form of hayfever.⁵ The disease makes its appearance near the middle of December and lasts until the middle of February. Dr. Key, with the assistance of Dr. Mary S. Young of the Department of Botany of The University of Texas, found that of the vegetation in this region, only "Juniperous Sabinoidea," better known as Mountain, Mexican, or Rock Cedar and "Juniperous Virginiana" or Red Cedar flowered during the winter hayfever season.

It has been said that before a given pollen can be accepted as the cause of hayfever it must satisfy the following conditions. 1. The pollen must contain the excitent of hayfever. 2. The pollen must be anemophilous or wind-borne, as regards its mode of pollination. 3. The pollen must be produced in sufficiently large quantities. 4. The pollen must be sufficiently buoyant to be carried considerable distances. 5. The plant producing the pollen must be widely and abundantly distributed. From the following discussion it can readily be seen that the cedar pollen satisfies the above conditions and can be accepted as the cause of hayfever.

Irritation vs. Protein Theory

The two theories that are generally accepted as reasons for pollen causing hayfever are, first, the irritation theory and second, the protein theory. The irritation theory is that the pollen is rough or covered with spines, like a grass burr, that irritate the mucous membranes of the nose, throat, and lungs. The protein theory is one that was established about twenty-five years ago by animal experimentations, *i.e.*, the blood of the allergic person is sensitive to certain proteins. Thus when pollen gets lodged in the nose, throat, or lungs of a person allergic to that pollen, sufficient pollen protein is absorbed into the blood to cause hayfever.

In Fig. 4 the dry pollen is shown; in this condition it is shriveled, rough, and dry. If it stayed in this condition it might readily cause irritation of the mucous membranes, but as this rough, dry pollen comes in contact with the moisture of the

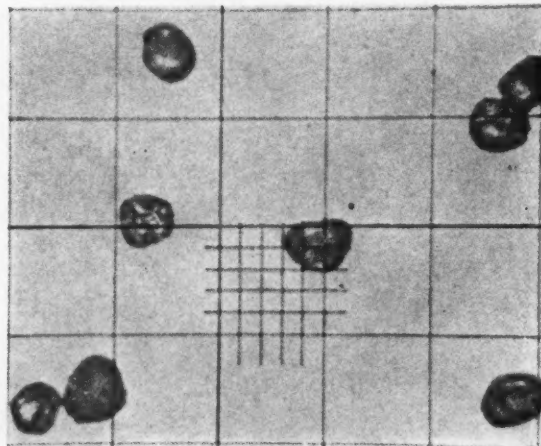


Fig. 4. Dry cedar pollen, shriveled and rough, natural state.

nose, throat, or lungs it readily absorbs large quantities of moisture. This absorption of moisture causes the dry shriveled pollen to swell and fill out into a full spherical condition without roughness or burrs of any kind, as shown in Fig. 5. When the pollen grain is allowed to absorb more moisture it swells until the outside shell (exine) breaks and is thrown off, the cell is seen to consist of the protoplast containing the nucleus or nuclei, surrounded by the intine which is thick, homogeneous, and transparent; the protoplast is principally protein and water. In this unprotected condition the protein is readily absorbed into the blood stream. The pollen is shown in this condition with the broken exine and its accompanying pollen cell in Fig. 6.

Cedar-Pollen Distribution

The male cedar tree can be distinguished dur-

5. "The Etiology of Winter Hayfever in Texas," by Sam N. Key, M.D., *Texas State Journal of Medicine*, January, 1918.

ing the pollinating season by its brownish appearance caused by the innumerable small cones containing pollen. The cones can be seen in Fig. 7. as they grow on the tip of each branchlet. The pollen grains produced in these cones are 18 to 20 microns in diameter when dry and 20 to 22 microns when moist but with the exine still intact.

To obtain information as to the weight of these minute grains, the following method was used. A 0.1 gram of the pollen obtained from a cedar tree was placed in 175 cc. of fluid and shaken well. A 1 cc. sample of this fluid and its pollen suspension was placed in a Sedgwick-Rafter counting cell. To facilitate counting, the cell was then placed on a microscope (8 mm. x 20 hyplane eyepiece giving 420X) equipped with a mechanical stage and a "Whipple" ocular micrometer disk. The microscope thus equipped and calibrated with a stage micrometer, gave a 0.35 mm. square counting field. The average count of 150 fields was 105 pollen grains per field. The counting cell being 50 mm. by 20 mm. and holding 1 cc. of solution gives

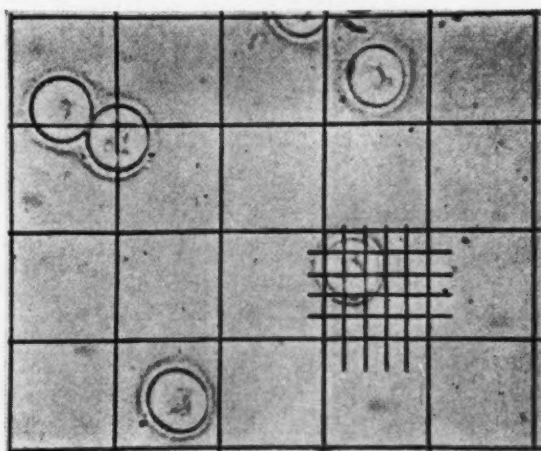


Fig. 5. Moist cedar pollen with outer shell (exine) intact.

8,160 counting fields per cell or per cc. Thus with 0.1 gram of pollen in 175 cc., 8,160 fields per cc. and 105 pollen grains per field, there are about 150 million pollen grains per gram of pollen, or each pollen grain weighs 1.46×10^{-11} pounds. Considering the facts that one tree can produce several pounds of pollen and that the average wind velocity during the pollinating season is about 10 miles per hour, it is therefore not unusual that cedar-pollen hayfever is prevalent in a large part of the State of Texas.

Another fact that leads to the large number of allergic cases is that the cedar grows abundantly in a region starting in the vicinity of Dallas and

running west about 300 miles and south about 500 miles into the northern part of Mexico. The trees grow in large enough quantities in this region that they furnish the only means of support for many families through the production and sale of cedar posts.

Hayfever Symptoms Mechanically Controlled

Tests were conducted in the laboratories of the Mechanical Engineering Department of The University of Texas with two primary objects in view. First, will cedar pollen cause a person allergic to it to have hayfever out of season, and second, will air filtration have any effect on the hayfever patient?

The preliminary tests consisted of placing several patients in a test chamber at different times. By adding pollen to the air in the chamber (unknown to the patient) it was found that concentrations of 150 to 300 pollen grains per cu. ft. of air caused the patient to have the hayfever symp-

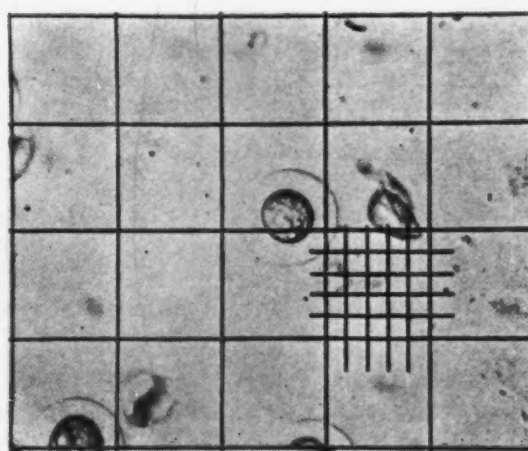


Fig. 6. Moist cedar pollen after outer shell (exine) has broken.

toms to a marked degree. The observer not being subject to hayfever was not affected at all. In each case after the patient showed an extreme condition of hayfever the air in the room was passed through a filter. Ten minutes after the filtering was started a marked relief was noticeable in the patient's condition, and after a period of one hour practically all symptoms had passed away. These tests were so encouraging that it was decided to test several commercial filters for their ability to remove cedar pollen and subsequently to make recommendations as to the type of unit that would cheaply and efficiently remove the cedar pollen from the air.

The material so far published in this series has set forth the extent of the hay fever problem and its causes. In the last two sections, results of tests on pollen removal with an inexpensive fan-filter unit will be described.

Guaranteed Satisfaction Is the Basis for

Attic Fan Sales by Cole-Hagood, Austin, Tex.

GIVING the customer exactly what the customer expects in cooling effect, soundless operation, and trouble-free service sells attic fans for the Cole-Hagood Company, Austin, Texas. The firm does no house-to-house canvassing, radio or newspaper advertising, sends out no direct mail, employs no specialty salesmen or telephone solicitors—yet 105 attic fans were installed in 1939 and 1940 looks even more active.

Attic ventilation, is sold, by Cole-Hagood, solely on the basis of intelligent engineering and complete guarantee of satisfaction through the sales efforts of the two members of the firm plus enthusiastic recommendation of old customers.

Ninety per cent of all fans sold in 1939 went into houses, the other ten per cent was divided between commercial establishments, offices, and miscellaneous spaces. For instance, a tourist camp bought 18 fans—one for each cabin.

Since Cole-Hagood sells attic fans on the basis of "every installation satisfactory," it follows that intelligent engineering, coupled with careful installation, must be incorporated in each prospective contract. The firm follows several practices which experience indicates insure satisfactory jobs.

Precautions Against Noise

A noisy installation, the firm finds, usually means customer discontent and service. So noise is engineered out of each job by a few simple precautions. The grille to the fan was originally sized on the basis of two square feet of gross grille to each 1,000 cfm of air. A 42-inch fan (13,000 cfm) took a 3 by 9-foot grille. However, experience showed that usually one end of the 3 by 9-foot grille stayed clean in service (end away from fan) while the near end got dirty—indicating that only a portion of the area was taking the air flow and that 2 square feet of grille for each 1,000 cfm was too generous. Accordingly, Cole-Hagood now sizes grilles on the basis of $1\frac{1}{2}$ square feet of gross area to each 1,000 cfm and finds noise has not been increased and practically the whole area is used.

Another change from standard practice which experience indicated desirable relates to plenum proportions. The usual practice is to build the

plenum box as a rectangle with the long axis parallel to the long axis of the grille. Cole-Hagood builds their plenums nearly square and mounts the fan with the fan face parallel to the long dimension of the grille. Noise, for some reason, seems to be lessened by this construction.

Noise is also dampened and vibration is eliminated by the special plenum box and fan mounting used. The fan is mounted on a two-piece wood base as shown in a sketch. In the bottom of each piece, holes are sunk and in these soft springs are placed. Each spring is wrapped in canvass to kill spring squeak and the assembly permits the fan to "float" on the five springs.

The fan frame is connected to the plenum by 3-inch wide strips of canvas so that the fan is free of all direct connection to the structure of the plenum. Considerable experimenting has been done on the box, first because Cole-Hagood needed a box which could be mounted quickly and, secondly, because a completely smooth interior was thought to be essential. The construction is shown in the sketches.

Special Suction Box Used

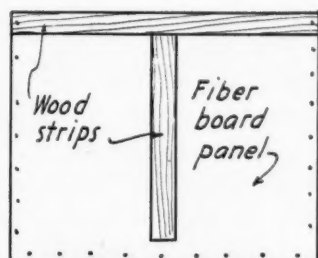
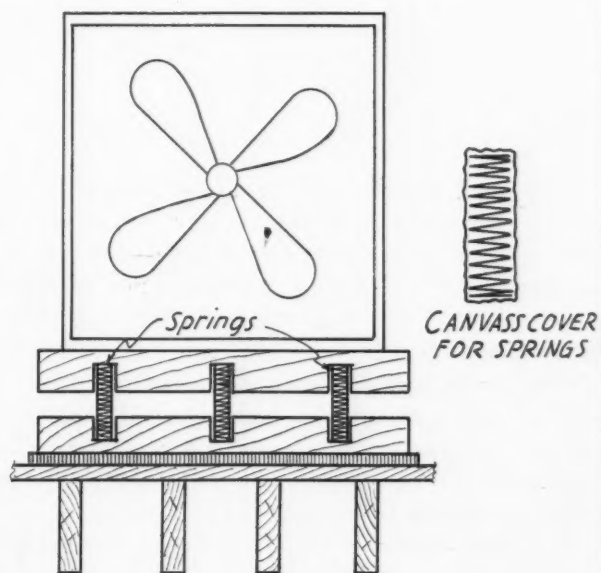
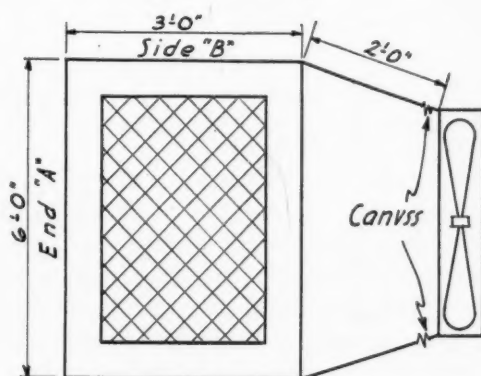
The matter of a box which could be erected quickly emphasizes two interesting features. Most attics in Austin are well above 100 degrees in summer—frequently above 125 degrees. Erectors find these temperatures hard to bear and a box which could be delivered ready for quick assembly was desired. As built, the box is fabricated as two sides, one top, one end, two "boot" sides and a boot top. The assembly and the parts are indicated in the sketches. Each piece is adequately stiffened by wood strips on the outside as shown. Three men can erect the box and fan and make all connections in four hours.

Erection Crews

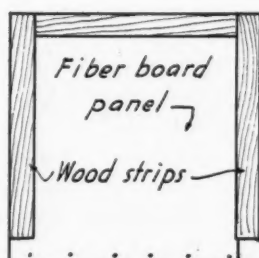
Erection has been standardized so that, except for local structural alterations, each job follows a set procedure. Cole-Hagood uses two crews. One crew cuts and frames the grille opening, measures for the box size and platform if needed and builds the box on the job using standard box parts. Three men need $1\frac{1}{2}$ hours working time to do this work. This same crew sets the box

(Continued on page 104)

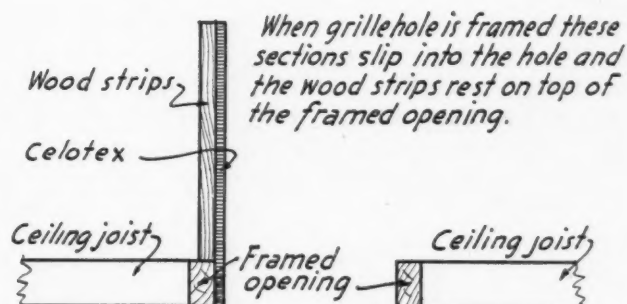
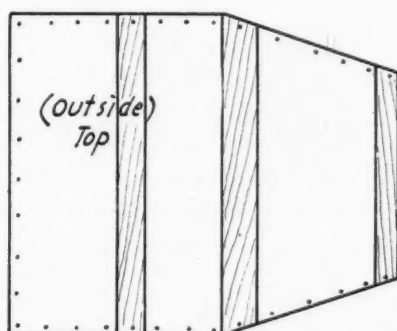
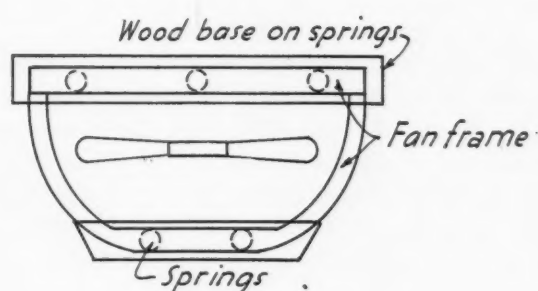
ex.



ELEVATION (Outside)
END PIECE "A"

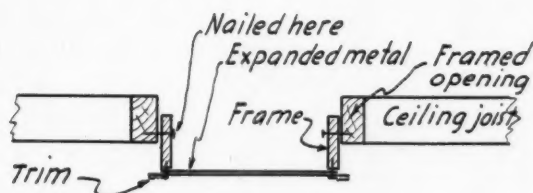


ELEVATION (Outside)
SIDE PIECE "B"



When grille hole is framed these sections slip into the hole and the wood strips rest on top of the framed opening.

The box is held together by nailing each section to the other.



The detail in the lower left is not exactly correct. The grille frame is not nailed as shown but is pushed up into the opening so the molding is tight against the ceiling and then nailed. The strip under the base spring block is celotex.

Cooling Load Reduction From Awnings and "Sun Screens"

UNTIL recently there has been only one practical method for reducing heat transmission through windows in summer time—the use of awnings. There are, of course, types of glass which do not transmit heat at standard rates, but we are speaking, in this case, of equipment which can be added without alteration.

Now another material has been introduced—the "Coolshade" sun screen and data are now available showing the heat reduction. These data are shown in accompanying tables.

For the benefit of contractors we reproduce, briefly, the facts pertaining to these two methods.

Awnings

The reduction in total cooling load effected by the use of awnings on all east, south and west windows of the Research Residence may be obtained from the curves in Fig. 13 from "Investigation of Summer Cooling in the Warm Air Heating Research Residence," Bulletin 290, En-

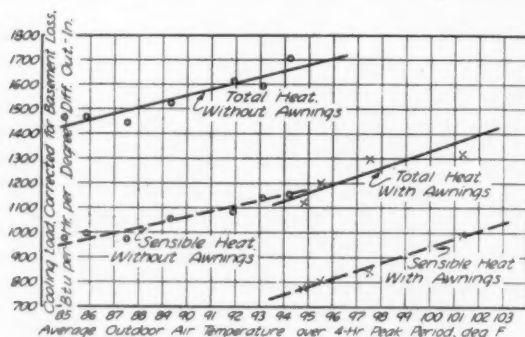


Fig. 13—Engineering Experiment Station University of Illinois, Bulletin 290.

gineering Experiment Station, University of Illinois. The bulletin states—"The curves in Fig. 13 overlap over a range of outdoor temperature of from 93 deg. F. to 97 deg. F., and it may be observed that over this range the reduction in both total and sensible cooling load was approximately 32 per cent. This comparison has been made between the cooling loads corrected for basement loss, since the only portion of the load effected by the awnings was that above the basement and the basement load would vary with different individual plants.

"It should be noted that the tests on the Residence without awnings were conducted during

the month of August, while tests with awnings were conducted during the month of July. . . Hence, slight differences would be occasioned by whether the tests with awnings were conducted in July or August. . . The comparison which has been made (Fig. 13) is equivalent to assuming that both series of tests were run in August."

"Coolshade" Screens

The data on "Coolshade" screens were reported by the Pittsburgh Testing Laboratory. In presenting the tables the following information is submitted:

"As considered in this report, the total heat gain through a window shaded with KoolShade Sun Screen may be divided into two parts, (1) Direct Solar Transmission through screen and glass and (2) heat gain by conduction through the glass. The sum of the two represents the total heat gain and the data on both factors, as explained below, are presented in form which permits their use by methods now generally accepted among engineers.

Explanation of Tables

"The accompanying tables represent Solar Heat Gains through Windows in excess of heat gain due to conduction. Thus they present data regarding KoolShade in a form similar to that (Continued on page 106)

Sample Calculations

Given: A building in Pittsburgh, Latitude 40 Deg. 28 Min. North, to be conditioned to 80 Deg. F. dry bulb.

To Find: Maximum cooling load through South windows shaded with "KoolShade."

Solution: Use Table 3, for 40 Deg. Latitude. Under Column 4, for South exposure, the maximum transmission is seen to occur at 12 Noon.

and Heat by Radiation = 6.0 Btu/sq. ft./hr.

From the foot of the column, "Effective Transmittance" is found to be 1.00;

From the A.S.H.V.E. Guide 1940, the design dry bulb temperature is 95 Deg. F. for Pittsburgh; room temperature is given as 80 Deg. F.:

Multiplying—

Heat by Conduction	Total heat gain
= 1.00 × (95-80)	= 6.0 + 15.0
= 15.0 Btu/sq.ft./hr.	= 21.0 Btu/sq.ft./hr.

Solar Radiation (in Btu per Sq Ft per Hr) Transmitted Through Windows With and Without Sun Screen for 30 and 35 Deg Latitudes, on July 21

(See Notes at Bottom of Table)

SUN TIME A.M.	SOLAR RADIATION						SUN TIME P.M.
	NE ←	E ←	SE ←	S ↔	SW →	W →	NW →
6:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	47 51 24	24 22 9	24 22 9	24 22 9	51 47 24	47 51 24
7:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	136 147 42	160 147 57	90 77 17	90 77 17	160 147 57	136 147 42
8:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	151 140 21	205 190 42	136 116 15.5	136 116 15.5	205 190 42	151 140 21
9:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	127 101 10	189 170 21	140 118 12	140 118 12	189 170 21	127 101 10
10:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	79 43 4	141 116 11.5	122 95 8.5	122 95 8.5	141 116 11.5	79 43 4
11:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	21 2 0.5	78 40 3.5	85 53 4	85 53 4	78 40 3.5	21 2 0.5
12:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	36 10 1	36 10 1	...	...
30 Deg Lat							
6:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	67 48 32.5	72 52 23	35 23 12	35 23 12	72 52 23	67 48 32.5
7:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	142 118 41	174 147 59	103 81 19.5	103 81 19.5	174 147 59	142 118 41
8:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	150 130 19.5	209 187 42	145 126 17.5	145 126 17.5	209 187 42	150 130 19.5
9:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	118 86 9.5	191 170 21	154 132 14	154 132 14	191 170 21	118 86 9.5
10:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	60 27 2.5	143 113 11.5	139 113 11	139 113 11	143 113 11.5	60 27 2.5
11:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	2 4 ...	75 40 4	103 73 6	103 73 6	75 40 4	2 4 ...
12:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	55 23 2	55 23 2	...	...
35 Deg Lat							
6:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	89 46 39	99 52 15.5	52 25 15.5	52 25 15.5	99 52 15.5	89 46 39
7:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	149 109 37	194 147 64	125 91 25	125 91 25	194 147 64	149 109 37
8:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	140 110 15.5	190 145 45	171 145 25	171 145 25	190 145 45	140 110 15.5
9:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	92 57 6.5	194 170 23	183 160 20	183 160 20	194 170 23	92 57 6.5
10:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	33 6 ...	144 116 11.5	171 149 15.5	171 149 15.5	144 116 11.5	33 6 ...
11:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	98 69 8	98 69 8	...	...
12:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	91 59 5	91 59 5	...	...

Data on intensity incident to vertical surface reprinted by permission from Heating, Ventilating, Air Conditioning Guide 1940, Chapt. 8.
Data on transmission through single window glass from Figuring Solar Heat Gains of Buildings, by William Goodman, HEATING, PIPING AND AIR CONDITIONING, May and June, 1938. Copyright by author.

Data on transmission through sun screen from calculations made by Pittsburgh Testing Laboratory, based on their tests for the manufacturer. These data represent solar heat gain through windows in excess of heat gain by conduction through glass (as do the data for bare windows). Total heat gain being determined by adding the value of heat gain by conduction. Data reproduced by courtesy of Ingersoll Steel & Disc Div., Borg-Warner Corp.

Solar Radiation (in Btu per Sq Ft per Hr) Transmitted Through Windows With and Without Sun Screen for 40 and 45 Deg Latitudes, on July 21

(See Notes at Bottom of Table)

SUN TIME A.M.	SOLAR RADIATION						SUN TIME P.M.
	NE ←	E ←	SE ←	S ↔	SW →	W →	NW →
6:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	72 47 33	80 52 38.5	40 24 13	40 24 13	80 52 38.5	72 47 33
7:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	143 114 38.5	180 147 60.5	112 86 22	112 86 22	180 147 60.5	143 114 38.5
8:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	143 124 17	211 190 42.5	155 124 20.5	155 124 20.5	211 190 42.5	143 124 17
9:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	71 8	192 22	168 17	168 17	192 22	71 8
10:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	46 15 1.5	143 116 11.5	156 132 13	156 132 13	143 116 11.5	46 15 1.5
11:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	121 93 8.5	121 93 8.5	...	...
12:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	103 74 6	103 74 6	...	...
40 Deg Lat							
6:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	89 46 39	99 52 15.5	52 25 15.5	52 25 15.5	99 52 15.5	89 46 39
7:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	149 109 37	194 147 64	125 91 25	125 91 25	194 147 64	149 109 37
8:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	140 110 15.5	190 145 45	171 145 25	171 145 25	190 145 45	140 110 15.5
9:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	92 57 6.5	194 170 23	183 160 20	183 160 20	194 170 23	92 57 6.5
10:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	33 6 ...	144 116 11.5	171 149 15.5	171 149 15.5	144 116 11.5	33 6 ...
11:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	98 69 8	98 69 8	...	...
12:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	91 59 5	91 59 5	...	...
45 Deg Lat							
6:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	89 46 39	99 52 15.5	52 25 15.5	52 25 15.5	99 52 15.5	89 46 39
7:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	149 109 37	194 147 64	125 91 25	125 91 25	194 147 64	149 109 37
8:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	140 110 15.5	190 145 45	171 145 25	171 145 25	190 145 45	140 110 15.5
9:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	92 57 6.5	194 170 23	183 160 20	183 160 20	194 170 23	92 57 6.5
10:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	33 6 ...	144 116 11.5	171 149 15.5	171 149 15.5	144 116 11.5	33 6 ...
11:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	...	...	98 69 8	98 69 8	...	...
12:00	Intensity Incident to Vertical Surface Transmitted thru Single Window Glass-Bare Transmitted thru Window with Sun Screen...	91 59 5	91 59 5

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Data on transmission through single window glass from Figuring Solar Heat Gains of Buildings, by William Goodman, HEATING, PIPING AND AIR CONDITIONING, May and June, 1938. Copyright by author.

Data on transmission through sun screen from calculations made by Pittsburgh Testing Laboratory, based on their tests for the manufacturer. These data represent solar heat gain through windows in excess of heat gain by conduction through glass (as do the data for bare windows). Total heat gain being determined by adding the value of heat gain by conduction. Data reproduced by courtesy of Ingersoll Steel & Disc Div., Borg-Warner Corp.

Winter Air Conditioning For a Modern Poultry House

By J. E. Peterson

Hinsdale, Ill.

THE productivity of the modern poultry plant requires coordination, by management, of a number of interdependent factors, each of which contributes toward the plant's economic success. Inherited characteristics of the flock are important because skillful management cannot overcome the disadvantages of poorly bred stock. A feeding program fitted to the inherited characteristics and type of production sought assists in bringing out the good qualities of a breed. Housing facilities, which include provision for ventilation, sanitation, feeding and reasonable control of temperature and humidity, must be economically practical and designed for efficient operation.

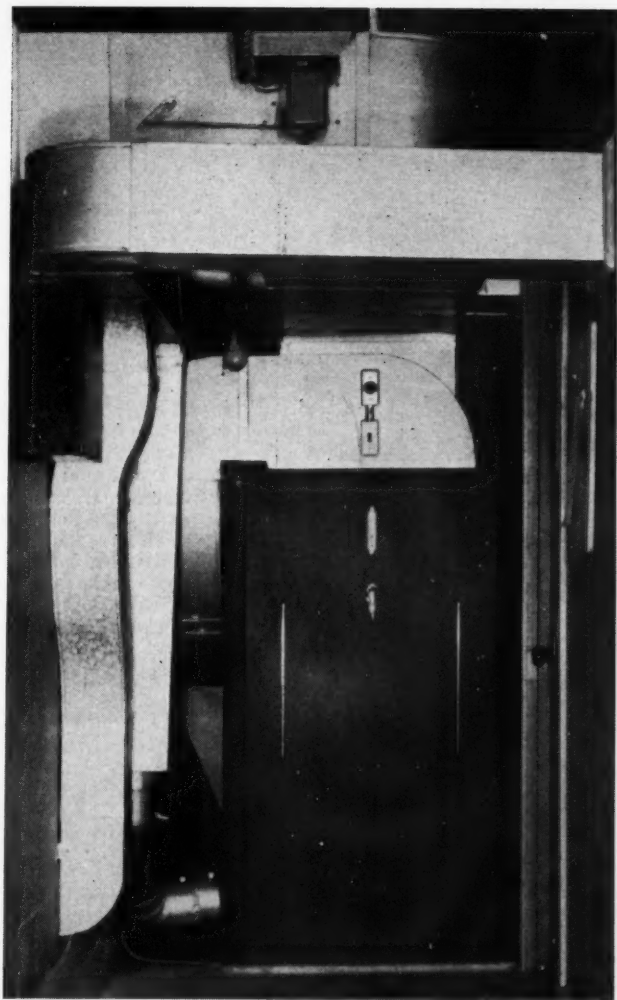
While the advantages of raising poultry in confinement, as against the run of the range method, may be subject to discussion, the objective is year around production. Egg and meat production

may be maintained during seasons when the natural cycle of production decreases sharply. Obviously, market prices are high during periods of low natural production and scientific poultry raising aims at these high market cycles.

The Hales and Hunter Company, manufacturers of Red Comb Poultry Feeds, maintains an experimental poultry house and laboratory in conjunction with their feed mill at Riverdale, Illinois. Here the dietetic value of poultry mashes is analyzed and projected into practical feeding programs. The building is frame and simple in its structural details. The wall structure consists of common studding, sheathing, siding. All interior surfaces are covered with wallboard. The outside walls, second floor and laying room ceilings are insulated with metal foil. While insulation between heated rooms is unusual, it was done



Exterior of the poultry house showing the louvers of the individual exhaust fans and general construction of the building.



The new oil-fired, winter air conditioner. Note the direct-to-outside air duct to the burner (see text). A zone damper shows above the bonnet.

in this case to reduce losses through the starting room, on the second floor, where the new-born chicks are housed. The first floor is concrete provided with drains so it may be conveniently washed down with water at frequent intervals. The second floor, being wood, is painted periodically as a similar sanitary measure. Each room or department represents a phase in the fowl's life and is equipped with batteries which vary from 3 to 6 tiers in height.

Ventilation Very Important

While the ventilating requirements of poultry will vary with differences between outside and inside temperature, humidity, and the number of birds in each room, a constant supply of fresh air is imperative. Fresh air is admitted into each room through adjustable openings under each battery and is conveyed through the metal ducts under the second floor and the concrete tunnel

Right—Duct work in one of the laying rooms. Hens are in batteries. Fresh air is introduced through a duct which runs beneath the batteries (See plan).

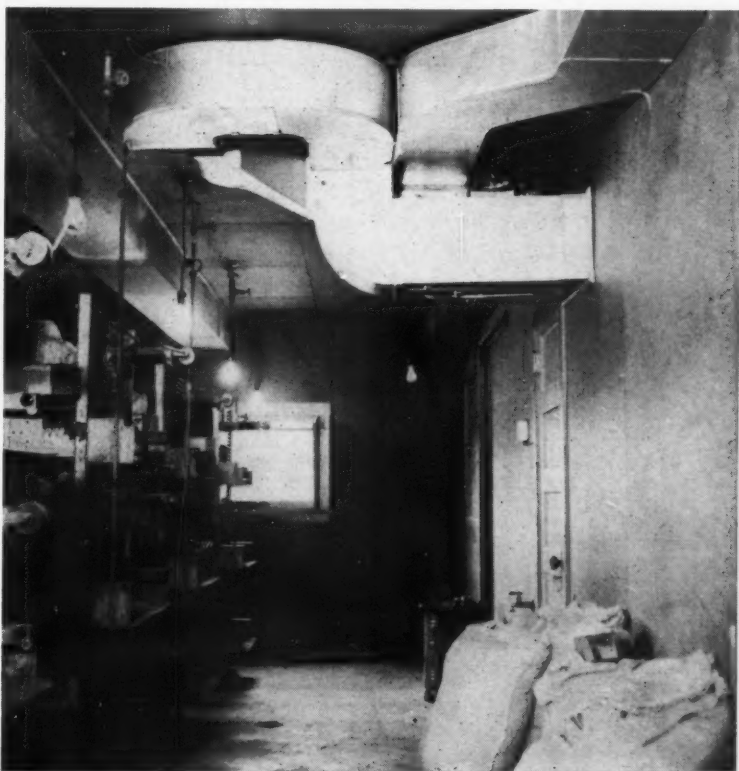
under the first floor. These provisions are indicated in the heating layout. Exhaust is accomplished with individual fans arranged in a wall-board duct, open at the floor and extending to the fan at the ceiling. A door at the ceiling, immediately in back of the fan, allows manipulation to exhaust air from either the floor or ceiling.

The ventilating system provides 12 air changes per hour in the starting room, and 8 changes per hour in all other rooms. Exhaust may be varied by manipulating the ceiling door and the number of fans in operation. During non-heating months, air is discharged largely from the ceiling and during heating months, from the floor. The combination of individual discharge fans exhausting air from the floor or ceiling, adjustable fresh air inlets and warmed fresh air from the present winter air conditioning system allows variations to provide for almost any demand.

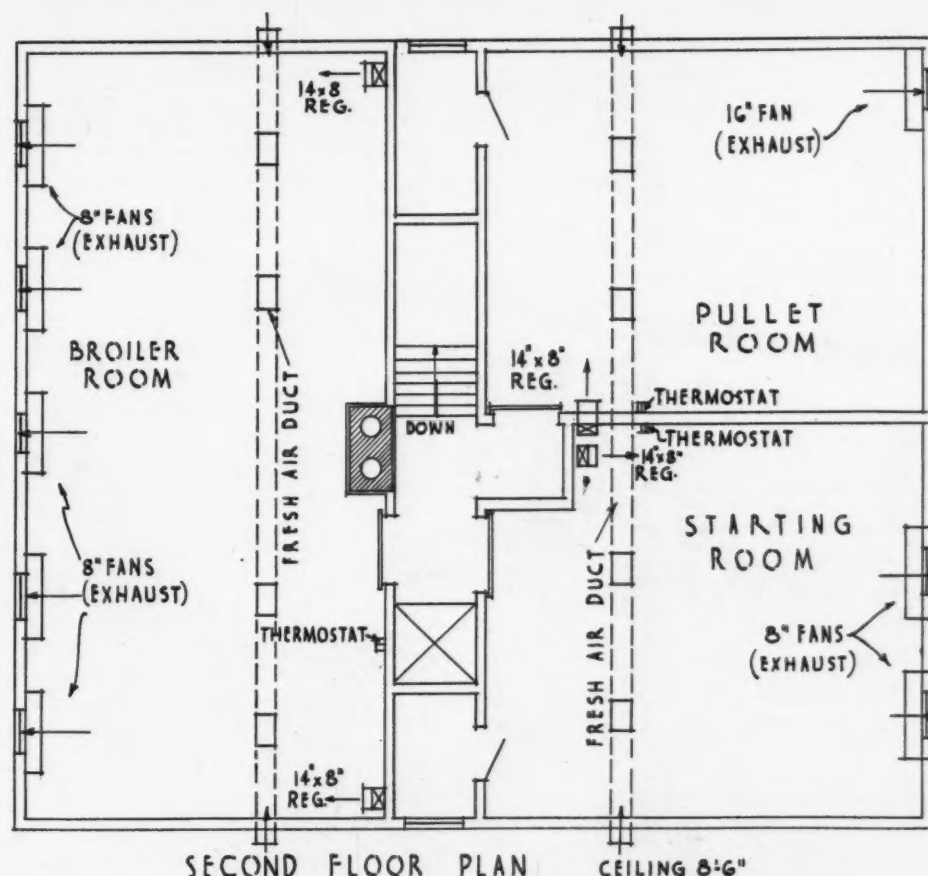
For example, during winter months humidity may be confined to a tolerable range, under varying conditions, by exhausting cold air from the floor plus a small amount from the ceiling and admitting a small amount of air through the fresh air inlets. Obviously, this combination will cause the zone thermostat to demand longer operation of the heating system and result in ample ventilation at the desired room temperature.

Temperature and Humidity Specifications

Rooms, because of usage require different temperatures—from a high temperature in the incubator room to a low temperature in the laying room. The starting room contains the newborn chicks after they are removed from the incubators. Here they are placed in batteries and the room maintained at 80 degrees. Over a week's time the temperature is lowered to 70 degrees. At 4 to 5



The second floor is much like the first and the air distribution and exhaust practically identical. Below —Diagram of the duct system at the furnace showing pipe zones and zone dampers. The text explains how the system was wired to give complete control over the operations.



heaters in each room, fired with pot-type oil burners. The ventilating fans created sufficient vacuum within the structure to pull flue gases from the smoke pipe draft regulators and joints of the heaters. While a means for heating fresh air by passing the air over these heaters was provided, the leakage of flue gases necessitated opening the fresh air intakes in each room which allowed unheated air to circulate, causing drafts of drastic temperature differentials.

A Conco oil-fired air conditioning unit was placed under the central stairway as shown in the heating layout. The blower was connected to

the concrete lined fresh-air tunnel under the first floor and a weather-proof louvre placed at the outside entrance to this tunnel. A 2-speed blower motor allows a low blower control setting as well as maximum blower operation. Because only outside air is used, alternating between the two speeds takes places when outside temperature is low, avoiding on and off operation.

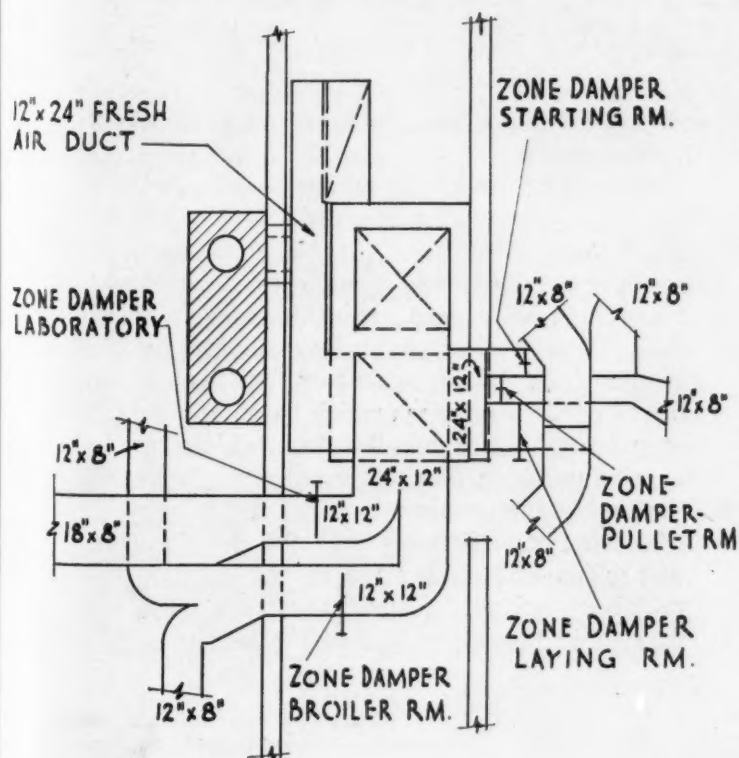
Investigation of operating conditions revealed the building was under .06-inch vacuum caused by the exhaust fans. This was determined by setting up a draft gauge outside the building under atmospheric pressure and inserting the tube into the building through a small opening. To prevent the suction of flue gases, a separate fresh air duct was installed to supply combustion air. The duct was connected directly to the oil burner air intake and insures an adequate and independent supply of combustion air.

Directional-flow, Hart and Cooley No. 86 registers with both horizontal and vertical blades were placed at the ceiling and discharge horizontally. A complete diffusion may be accomplished because the wide range of directional control allows banking the air stream against a ceiling or an adjacent wall should spotty conditions be disclosed.

The control system is designed for complete flexibility and maintains selected temperatures in each of the 5 zones; starting room, broiler room, pullet room, laying room and laboratory.

Five Minneapolis-Honeywell zone control units were installed, two of which are equipped with

(Continued on page 109)



this Summer...
let a window ventilating fan
end **THIS** for you . . . !



No need to swelter this summer . . . a window ventilating fan will turn your home into a summer resort . . . and at less cost than a two weeks' vacation! Fan owners say it's cooler—and far more comfortable—to stay at home than to go away for the warm months. Especially adapted for apartments and rented homes, the compact, self-contained window fan unit, protected by a grille, fits into the window frame. Easily removed, it can be taken with you when you move.



WHOLE FAMILY FEELS BETTER



NEW ZEST FOR MEALS



KITCHEN HEAT AND ODORS GONE!

**OPERATES FOR FROM
5c TO 10c A DAY**

Imagine your home kept comfortable throughout a scorching day . . . getting a sound night's sleep . . . all at the price of a bottled drink. But that's just how cheaply a window ventilating fan will operate. Let us send a representative to give you complete information . . . no obligation . . . just call RAYmond 7751.

NEW ORLEANS PUBLIC SERVICE INC.

In New Orleans Window Fans Are Outselling Attic Fans in 1940

As the title implies, an interesting change is taking place in New Orleans. The important disclosure is that where renters buy fans for cooling, a unit which can be moved readily (even shifted from room to room) has an appeal. The New Orleans Public Service Co. has much valuable information on this question.

IN NEW ORLEANS, indications are that there will be more window fans sold than attic fans in 1940.

This interesting, and perhaps portentous trend, has been gathering momentum for the past three years. The change is not coming about just because of lesser cost, but because under conditions comparable to New Orleans the window fan fills a needed requirement.

According to reports from the New Orleans Public Service Co., Inc., window fans first became a factor in 1938 when 423 attic fans and 167 window fans were sold. In 1939 the totals were 921 attic fans and 658 window fans. In 1940 the Public Service Co. expects about 1,500 attic fans

and 2,000 window fans, or some figure in about this proportion.

The reasons for this trend are peculiar to New Orleans, of course, but are probably also applicable to many other cities. In New Orleans there are about 100,000 homes of all types. Two-thirds, or about 66,000 homes are rented, tenant occupied. These renters are just as anxious for the benefits of air cooling as owners, but they do not wish to pay to alter work which becomes a part of the property. The window fan, which can be mounted or taken down as readily as a venetian blind, solves the problem.

As the Public Service Co., sees the situation, the problems of application of the window fan are about solved. Fans have been and are mounted in the upper half of the window or in

the lower half; inside the room or outside the window. Inside the room, at the upper sash is now most favored. Perhaps the critical dimension is the height of the sash. About 29 inches will meet most windows. Therefore the fan housing is built as shallow as possible to avoid sticking into the room objectionably and as wide and as high as the average one-half window frame.

The popular fan sizes are about 30-inch diameter and 5,000 to 7,000 cfm capacity.

Usually one fan is considered sufficient. The fan is placed in the window of a room about as near the center of the floor as possible in order to pull air from both ends. As with an attic fan, control of air flow is obtained by opening and closing windows. The window fan, generally, does not do as well as an attic fan in two-story spaces but, since window fan prices run from \$50 to \$80, installed, the large house owner or tenant will buy two fans—one for each floor.

Records of the Public Service Co., show that because the window fan does not exhaust the air in the attic, the window fan runs longer than the attic fan. The hot attic air builds up temperature in rooms below through radiation so the fan must combat this additional load. This is particularly severe in uninsulated attics.

Trend Stimulated by Advertising

This trend toward window fans has been responsible for the increased space devoted to window fan advertisements by the New Orleans Public Service Co. In 1939 five advertisements were used; in 1940 eight advertisements will ap-

I'm glad we're putting in attic ventilation NOW

Enjoy your new home right from the start... include attic ventilation WHEN YOU BUILD. Ceiling grilles and attic openings can be provided at little or no additional cost at the time of construction. And, under the liberal home financing now available, you can include the cost of attic ventilation equipment in your loan—in most cases less than a dollar will be added to your monthly payments.

IF YOU RENT...
...and your landlord won't install attic ventilation, now you can enjoy cool summer comfort with a portable window ventilating fan. Inexpensive to buy and operate, this new type fan will comfortably cool three or more rooms depending on the arrangement of your house. Easily dismantled, it can be moved when you do.

OPERATES FOR FROM 5c TO 10c A DAY
A cool night's sleep for the whole family at the price of a bottled drink! Seems absurdly little, doesn't it? On many a stifling night you would have gladly paid many times that amount for relief. Let us send a representative to show you how inexpensively you can provide your home with adequate ventilation. Call RAYmond 7751.

START THE DAY REFRESHED AFTER A GOOD NIGHT'S SLEEP
A sound night's sleep gives you far more energy to face the day's tasks. Summer doesn't "wear you out" when you have the night-time comfort of a ventilating fan.

EVERY ROOM LIVABLE
There's no need to desert the house in favor of the porch... attic ventilation makes the whole house comfortable. The family like to stay home and summer entertaining becomes enjoyable.

NEW MEALTIME COMFORT WITH WINDOW FAN
Summer appetites make a quiet come-back when you install a ventilating fan. Inset shows how fan fits into window.

NEW ORLEANS PUBLIC SERVICE INC.

The two illustrations show typical New Orleans Public Service company advertising. Note the recognition of window fans in the copy and illustrations.

pear. Of these eight, five ads definitely emphasize the window fan while three ads apply to both window and attic fans equally.

Evaporative Coolers Outsell Attic Fans in San Antonio

AN interesting situation has been developing in the sales of attic fans in San Antonio, Texas. As reported in the May, 1938 issue of *AMERICAN ARTISAN*, active promotion of attic fans has been carried on in San Antonio since 1936. Attic fan dealers and the San Antonio Public Service Company have cooperatively worked to promote sales. The utility gave space for display, assigned engineers to offer recommendations on fan sizes and installation, made available several thousand selected names of property owners. Dealers selected manufacturers' literature for mailing and both dealers and the utility joined forces in newspaper advertising.

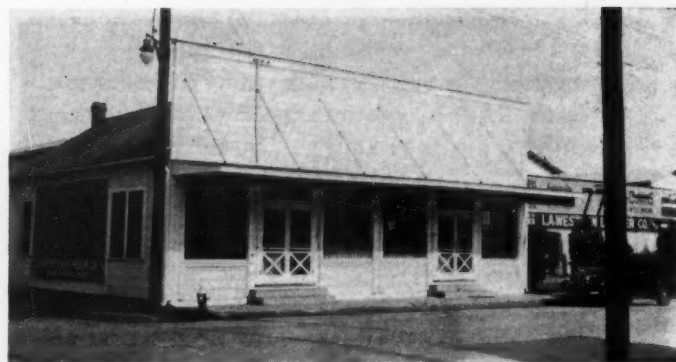
As a result of these efforts, attic fan sales increased yearly; rising from a few units in 1936 to more than one hundred in 1939. While sales

have never reached the volume attained in other southern cities, the sales have been thought satisfactory, all conditions considered.

The interesting situation which developed last year is that without any utility promotion, evaporative coolers outsold attic fans in 1939. According to utility reports in 1939 over one hundred attic fans were sold, but between 400 and 500 evaporative coolers were sold in the same period.

This trend has been somewhat surprising, since many contractors and engineers felt that evaporative coolers might not "do so well" under certain local conditions. None the less, the evaporative cooler, moving approximately the same volume of air as the attic fan and obtaining some decrease in dry bulb temperature without too

(Continued on page 122)



Left—Show Room and Yard; Right—Office of the attic fan dealer whose sales methods are described. In small towns business men must diversify to live.

Conservative Sales Methods Of a Small Town Attic Fan Dealer

By W. C. Rowland, Jr.

IN the South and Southwest where attic fans in large numbers are sold by numerous agencies in many lines of merchandising, it is probable that upwards of 80 per cent of all fans sold are merchandized by organizations not set up specifically for that purpose.

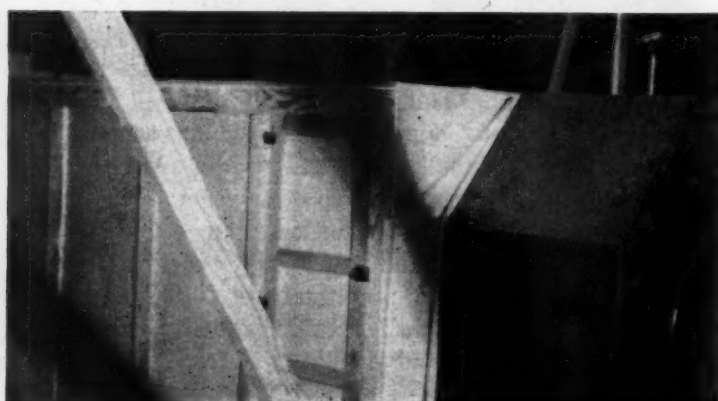
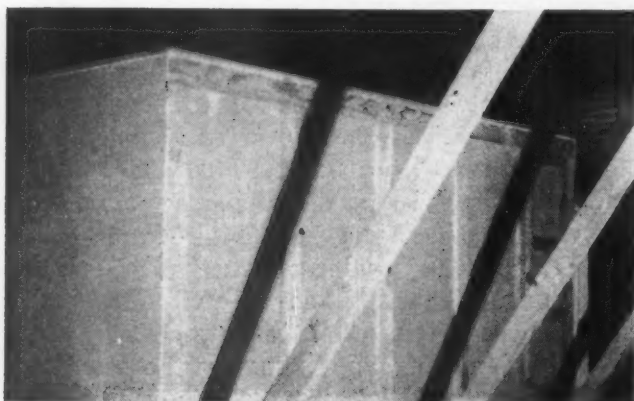
Sheet metal shops, hardware stores, electric appliance companies, plumbing and heating firms, building supply houses, even drug stores, department stores and filling stations are dealers. Whether or not these agencies make a good dealer and obtain their share of the business depends on the efficiency of the dealer's sales organization, the quality and price of his unit and the source of prospects.

Whether or not the agency continues in busi-

ness year after year is determined by the dealer's fundamental knowledge of the proper application and the limitations of an attic fan and by his desire to make each job the best installation possible.

This accounts for the fact that in the South many firms believing in diversity of activity sell many products in many fields. Thus the attic fan dealer whose program is described is first of all a building supply dealer, but secondly, and actively, a warm air heating contractor, a roofer and handles numerous sheet metal products.

This organization—Louisiana Western Lumber Company of Lake Charles, Louisiana—is typical of the better class of attic fan installer in the smaller towns of Louisiana and Texas. In larger cities specialty organizations can and do deal in attic fans exclusively or handle two or three re-



Two views of fan and suction box of a typical attic fan installation. The box is fibre board, stiffened with 2" by 4" wood framing. A wide canvas connection is insisted on.

BROADCAST OF KPLC

Week of May 2, 1939

Tuesday, 6:15; Wed., 12:30; Thrs. 7:40; Fri., 6:15; Sat., 12:30; Mon., 7:40

Each days as the thermometer goes a little higher your interest in attic ventilation should increase. Of course, the nights are still cool but that condition will not last much longer. There will soon be sweltering hot nights with resulting loss in sleep.

Through the installation of an attic ventilating fan, you can avoid this discomfort. But when you select an attic fan, be sure that you buy one that is quiet, efficient, and economical to operate. Also be certain that you buy the right sized fan and that it is properly installed.

The Louisiana Western Lumber Company sells, and unqualifiedly recommends to you, the Ventura Attic Fan, which is manufactured by the American Blower Company. The Ventura Fan is quiet, efficient, economical; is reasonably priced, and can be bought on monthly payments. And of equal importance, the Louisiana Western will install your Ventura Fan properly.

Installing a Ventura Fan in your home is an investment in health and comfort for you and every member of your family.

Call the Louisiana Western at 778 in Lake Charles or 4721 in Sulphur, and ask for Mr. Lester Morris to make a survey of your home for a Ventura Attic Fan.

BROADCAST OF KPLC

Week of June 13, 1939

Tuesday, 6:15; Wed., 12:30; Thrs. 7:40; Fri., 6:15; Sat., 12:30; Mon., 7:40

As the temperature climbs your interest in an attic fan is sure to increase for it is only through the installation of this type of ventilation that you can be sure of cool nights all through the hot summer months—at a moderate cost.

The Louisiana Western Lumber Company sell the Ventura Attic Fan—the fan which is quiet, efficient and economical.

Knowing the importance of proper installation the Louisiana Western has had Mr. Lester Morris make a special study of attic fan installation and all fans are put in under his supervision.

If you are interested in having a cool breeze every night through the summer, call the Louisiana Western and arrange for Mr. Morris to make a survey of your home for a Ventura Attic Fan.

The telephone number in Lake Charles is 778 and in Sulphur it is 4271.

Above—Typical spot announcements broadcast from the local radio station. Note the time, each day, the announcement is read. Every day except Sunday is used.

lated lines, but in the smaller communities a dealer must diversify to live.

In 1939 this organization installed 35 attic fans in Lake Charles. The fans were sold without resorting to sales stunts or high pressure selling and in accordance with conservative sales methods used for other products.

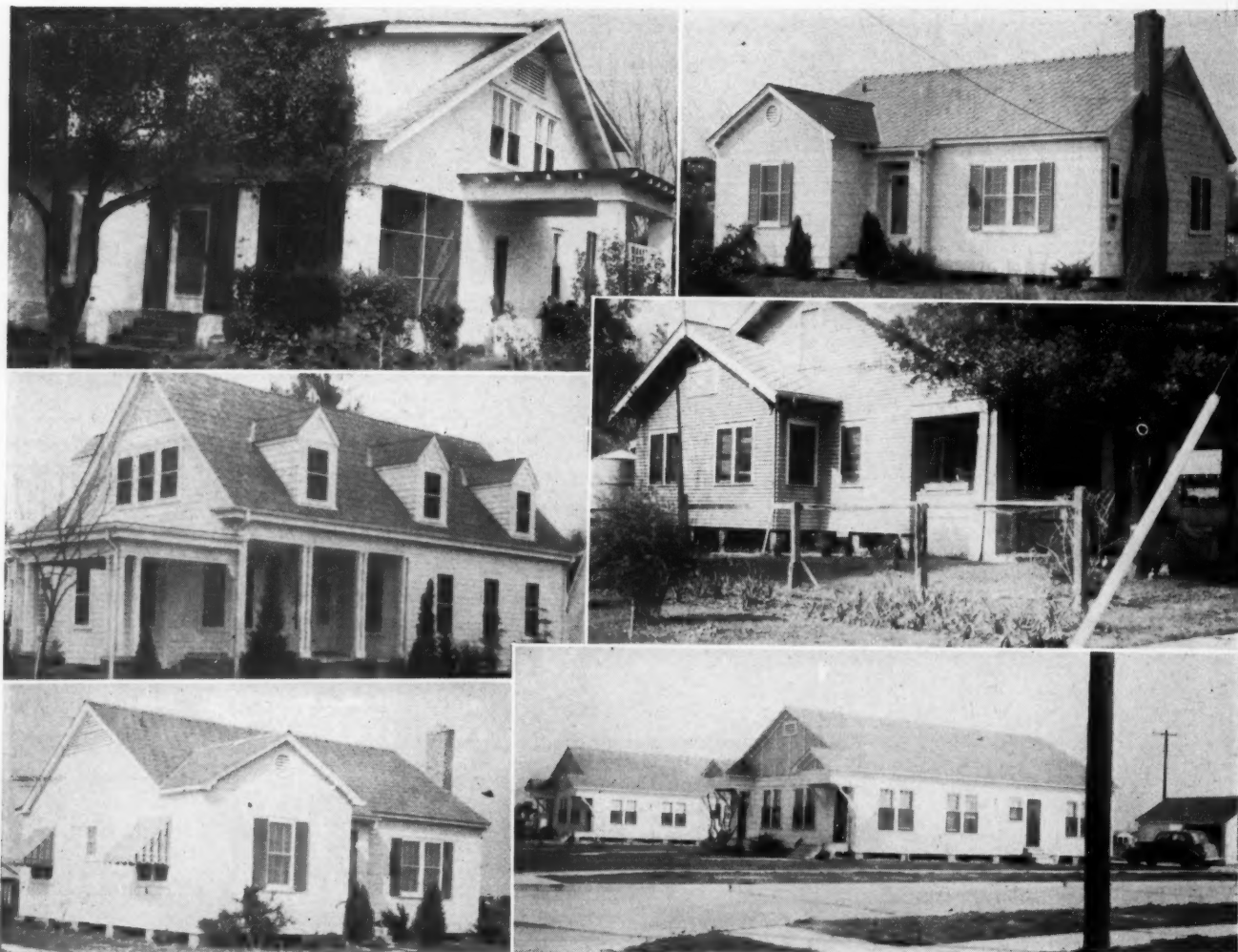
Lake Charles is a community of some 25,000 persons. It is a trading center for Southwest Louisiana, in the center of oil activity and its growing port handles most of the rice and a large share of the cotton and lumber produced in the state.

Lyle Peters and Alfred Roberts manage the organization. It is a policy to operate a small, compact, but efficient sales force, each man of which sells all the products handled by the firm. Thus attic fan sales are only one part of the salesman's duties. How salesmen are trained and operate may be of interest.

New salesmen have been taken in as the company expanded. Four men now constitute the force. Each man has been sent to some of the factories making products handled to receive special training in order to be equipped to render better-than-average service to the home owner or

Below—Sales room with large attic fan. Right—Wood grille for fan intake as designed and installed by the contractor who subcontracts installation.





Houses in which Louisiana Western has installed an attic fan run from smallest to largest, pretentious to cottage. Note the large exhaust louvre recommended by the company. Houses, in Lake Charles, are built for warm weather.

builder. Sales meetings are held each Monday evening attended by the full sales and office forces. Usually a manufacturer's representative is present to lead the discussion and to answer immediate questions. Special salesmen are not hired for seasonal business, the firm believing that pride in service makes for better customer satisfaction and better profits.

Sell But Do Not Install

The special visits of manufacturers' representatives is believed to broaden the salesmen's knowledge and keep the force acquainted with what is going on elsewhere. Methods and ideas which reduce installation costs and better sales technique are encouraged by these meetings. Louisiana Western does none of the installation work; a carefully selected contractor, specializing in installation, installs the fans according to the recommendations of the firm. Each installation is made in strict accord with manufacturers' recommendations plus the ideas the firm has proved valuable.

The work of the sales force is amplified by

diversified advertising. Billboards are used along all roads leading to Lake Charles. An attractive show room is maintained; buildings are illuminated at night. Manufacturers' literature on attic fans is consistently mailed to a selected mailing list. Newspaper advertising on attic fans is used twice weekly through the summer season. Also the firm believes in radio advertising and uses spot announcements before the morning and evening news broadcast of a local station. Typical announcements are shown.

The firm believes in keeping customers actively buying products and, as soon as an account is paid out on any other product, the name of the customer is given to a salesman as a good attic fan prospect.

Because the firm values highly its reputation as a distributor of good merchandise, each product is selected only after detailed study and after the firm is convinced that the product is the best of its kind or ideally suited to local conditions and clientele. In attic fans the firm is the exclusive franchiser in its parish for American Blower Corp.'s Ventura Home Conditioner.

AMERICAN ARTISAN

SHEET METAL

SECTION



DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING

Style in Steel

With Superior Checker Coat sheets you can make the appearance of your sheet metal work talk for you. Thousands of sheet metal shops are improving the looks of their jobs with this modern sheet. They are putting new style into sheet metal work.

Furthermore, "it's a great sheet from the start to the finish of a job," as one sheet metal worker puts it. Its uniform temper and superior coating make it a fine sheet to work with. For your next important job use SUPERIOR CHECKER COAT. It will talk for you for years to come. Ask your distributor for Superior Sheets—Checker Coat, Superior Galvannealed, Galvanized, Copperior, etc.

THE SUPERIOR SHEET STEEL CO., Canton, Ohio
Division of Continental Steel Corp., Kokomo, Ind.

Superior Checker Coat is galvanized by the SUPERIOR PROCESS with a distinctive bright spangle in pronounced individual squares or checkered blocks. It is made of special analysis steel rolled to a uniform gauge and correctly tempered for superior fabricating qualities.



SUPERIOR

OPEN HEARTH STEEL SHEETS

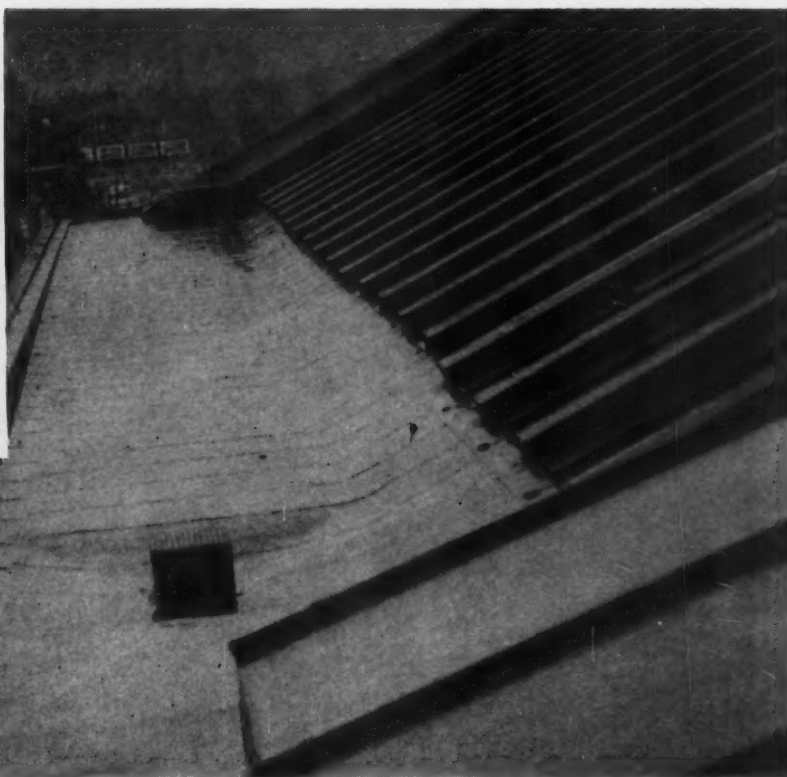


Photo 1—Correct installation details (large photo) stopped trouble. The old installation (small photo) had a tight-locked reglet and gutter sheets soldered to the sloping area. Reconstructed, the gutter is loose-locked to the slope and the outer edge is loose-locked to a reglet strip. The text explains fully.

Wide Gutters—

Need special handling and proper provision for expansion and contraction. Here are recommended practices

By Carter S. Cole

Engineer, Copper & Brass Research Ass'n

IN our previous article we discussed expansion in general and the application of expansion joints to relatively simple gutter construction. We remarked at the end that, when the gutter width is increased, proper provision for expansion and contraction needs special handling.

Consider, for instance, the problem presented in photograph No. 1. The small insert at the upper left-hand corner shows the original construction of this flat gutter. Fairly large sheets were used and these were not only soldered to the sloping batten portion of the roof but were locked tight into the reglet. Trouble ensued and it was necessary to modify the design to take care of the special conditions presented. In the first place, small sheets 14 by 20-inch were used in the reconstruction. The outer edge of the gutter

was locked into a separate strip in the reglet and the gutter proper connected to the sloping portion by a loose-locked seam.

While we are anticipating a little on the next article which will deal with "INTERSECTIONS" it is interesting to note the old and the new construction on this roof at the point of intersection of the sloping area and the gutter. The old construction is shown in photograph No. 2 and it will be noted that there is a soldered seam between the two portions of the roof and also that the batten was cut off short before this point of intersection.

Photo No. 3 shows the same detail on the new roof. The batten connection is at the line of the loose-locked joint between the sloping portion and the gutter. It might seem that the differences

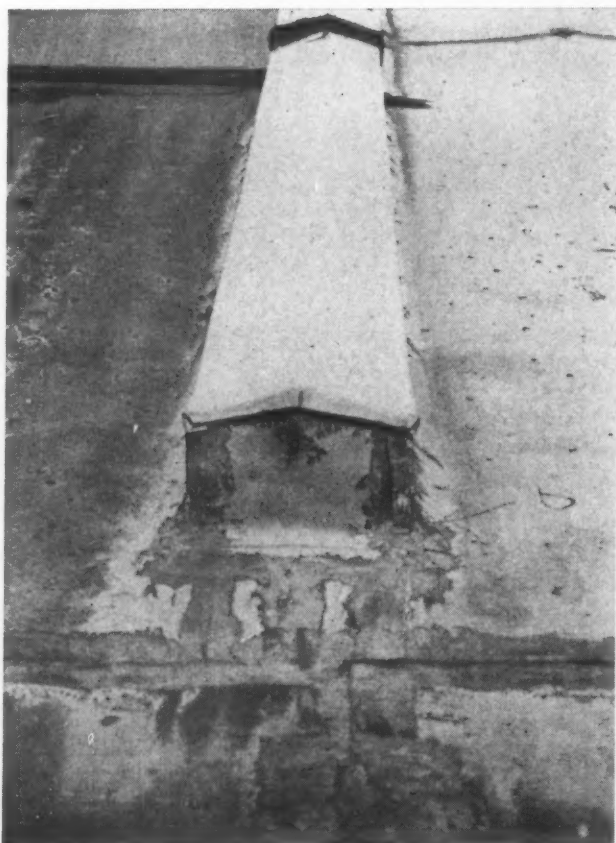


Photo 2—This roof gave trouble because the gutter and slope were soldered together and the batten was cut short of the slope, requiring much solder.

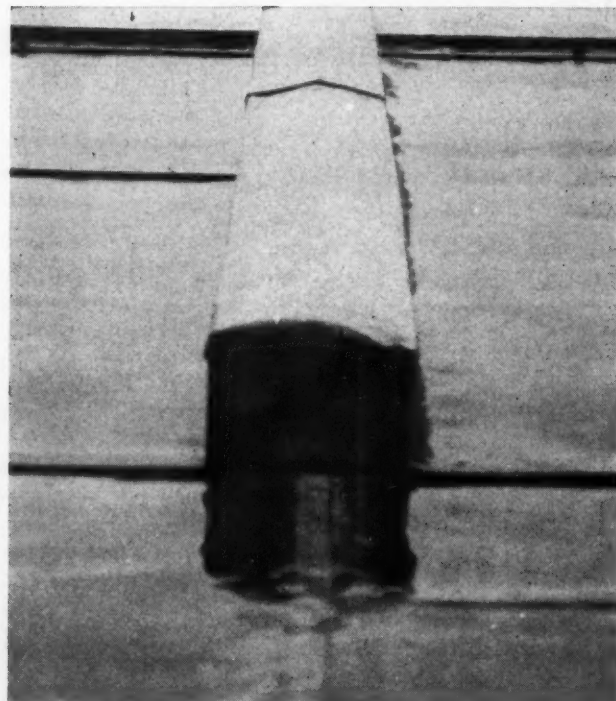


Photo 3—Reconstruction of Photo 2 shows the loose lock between gutter and slope and the batten extended to the end of the slope, eliminating much soldering and many small pieces.

in details in construction here were rather minor. Yet it is just attention to such details and the use of proper, instead of improper, construction that makes the difference between a roof which will give good service and one that will not.

Gutters Adjoining Rising Walls

Let's consider next the case presented in Photograph No. 4. We find a long gutter below the skylight between the skylight and the wall of the higher portion of the building. It is difficult enough to provide properly for expansion and contraction with such construction, but it was not helped in this case when the bottom portion of the gutter was laid with 8-foot sheets, directly nailed, not cleated. The length of the gutter was over 200 feet and the building superintendent wondered why the seam continually pulled apart.

A hint as to how this might have been handled is to be found in photograph No. 5. Here we find a very wide and deep gutter, even longer than the one we just considered. As you can see in the photograph, there is no pretense of an expansion joint in its entire length. Yet there has



Photo 4—Difficult construction was made worse by using 8-foot gutter sheets nailed down. This eliminated all chance for movement in the 20-foot gutter. Constant tearing occurred.

been absolutely no mechanical trouble with this gutter, nor any pulling apart of the seams due to movement caused by expansion and contraction. The reason for this is simple. Crimped copper sheets were used in this gutter construction—the crimps, of course, running *across* the gutter. The crimps have taken care of the precept which we mentioned in the last article; namely, taking care of expansion and contraction at many points instead of allowing it to build up over a long distance.

Gutters at Parapets

There seems to be an increasing tendency to finish a sloping roof area behind a parapet wall. Such a gutter is usually fairly wide and requires special thought and attention to some of the basic principles of good construction to insure satisfactory service. Some of the points are:

FIRST: and *this point is primarily the architect's responsibility*—there should be a good pitch to the gutter and adequate, quick drainage provided. Gutters should be designed to shed water—not to store it. Emergency outlets, usually scuppers, should be provided in case the regular ones become clogged or frozen up.

SECOND—the connection between the sloping roof portion and the gutter should be a loose lock seam two inches vertically above the top of the parapet, or the highest possible point to which water can rise if the regular drainage fails to function.

THIRD—Watertight joints at the wall connec-

tion. Through-wall flashing should be used and this may be locked to the base flashing—but, in any event, provision for emergency drainage should insure that water can never back up over the top of the base flashing.

FOURTH—but not least—proper provision for expansion and contraction of the gutter lining itself. Expansion joints—standard flat seam construction with small sheets (and possibly expansion battens)—crimped sheets—all may be used as they best fit the design—but—the gutter lining should not be rigidly connected to the slope or to the wall.

This brings us to the point where it seems in order to mention another place where we often find long runs of metal. A place, too, where standard expansion joints cannot be provided. The item here considered is base flashing, particularly where there are long runs of it along a parapet wall. Crimped copper is coming into use for this detail and is giving very satisfactory service.

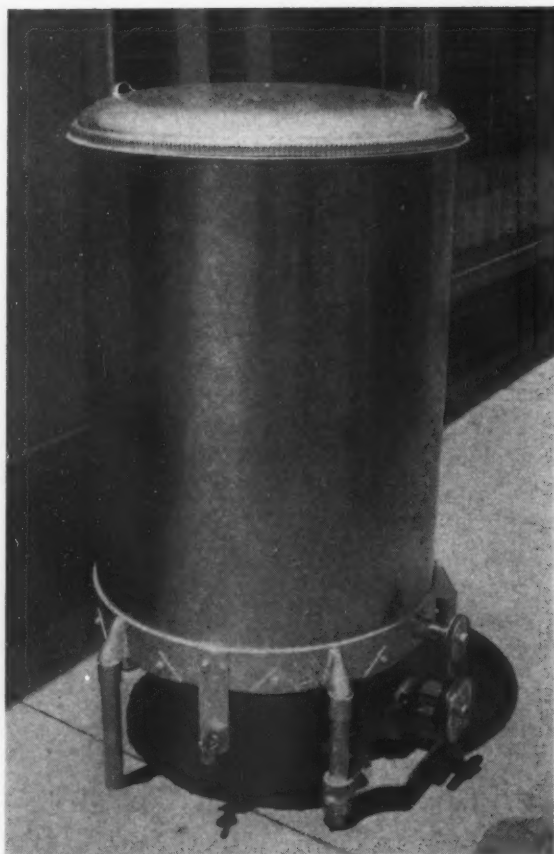
In using crimped copper to meet any conditions where other more orthodox methods providing for expansion and contraction are inadequate, it should be remembered that a sharp bend across the crimps nullifies their effectiveness. Therefore, on an outer edge of the metal—for instance, a strip bent back for stiffening—it does not matter if there is a sharp bend. However, any interior bends in crimped copper sheets should not be sharp but should be made with a radius of not less than about $\frac{3}{4}$ of an inch.



Photo 5—This wide and deep gutter was provided with expansion facilities by use of crimped copper sheets with the crimps running across the gutter. No trouble in ten years.

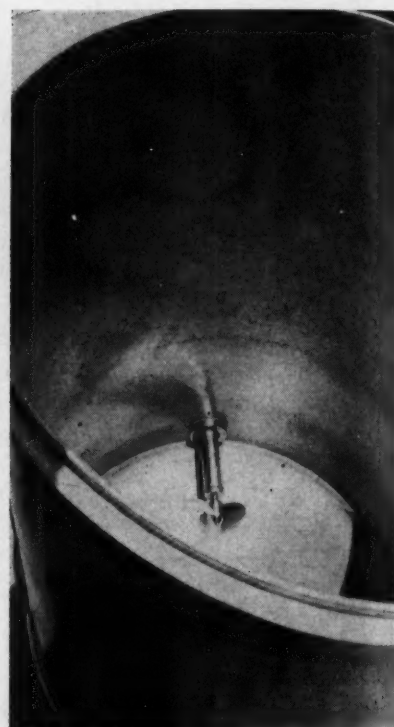


Photo 6—This gutter failed because large sheets without any expansion facilities were soldered to the slope, the connection is below the top of the parapet, there are no emergency outlets, the cap flashing is not through-wall, there is not sufficient pitch.



Above — Monday - fabricated upright tank. Final appearance is equal to the best die work. Right — Several sizes of upright tanks and inside of a tank showing smooth bottom-to-cylinder weld and excellent finish obtained with shop developed machines.

Stainless Steel Tanks Formed and Fabricated in "Monday-Made" Dies, Jigs, Machines



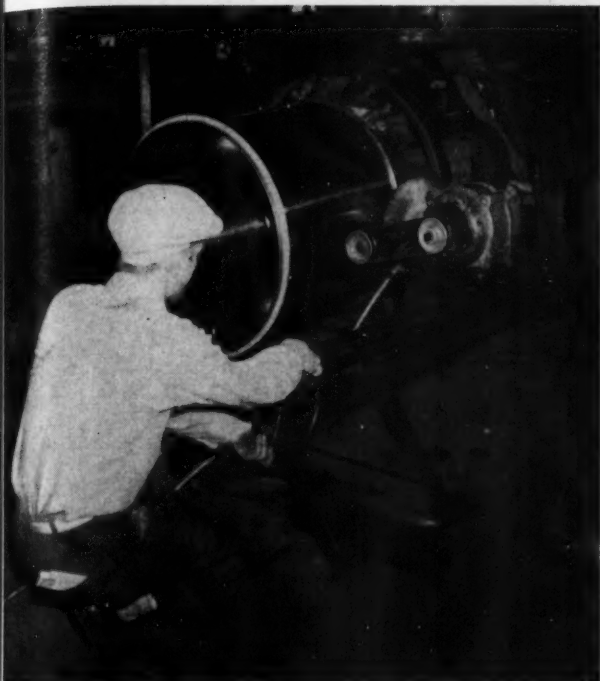
MONDAY MANUFACTURING COMPANY, Ft. Worth, Texas, originally an architectural sheet metal and ventilating contractor, has in the last few years turned more and more to the manufacture of sheet metal specialties—chiefly specialties made of stainless steel. Today the stainless steel tanks fabricated for the bottling trade have established an enviable reputation and wide distribution and constitute a large percentage of the firm's work.

This change in operations, as so often happens, came about through a chain of circumstances plus Mr. Monday's feeling that his experience should enable him to fabricate a better tank than the specifications submitted by his first tank customer.

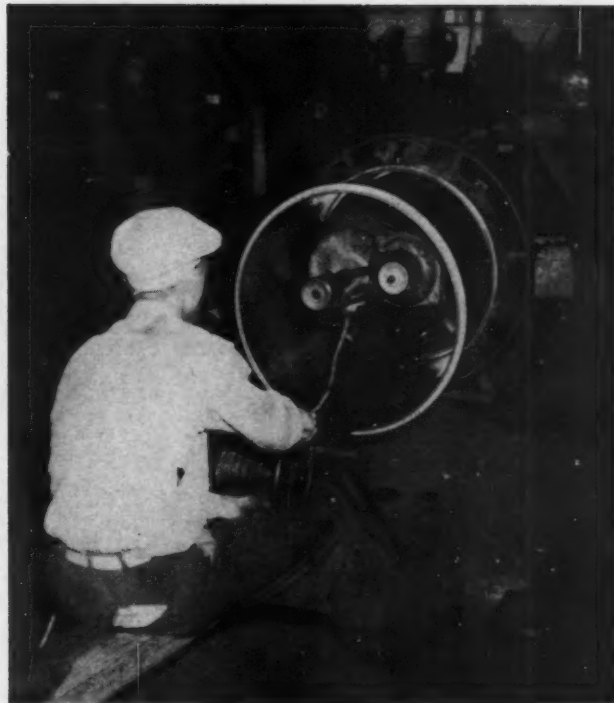
This first tank order called for a tank with a cone shaped top and bottom with legs extending to the top of the drum and welded to the drum. Mr. Monday felt that these legs constituted a dirt catching pocket which was unsightly

and unsanitary. Further, the cone-shaped bottom and top were formed by cutting a "V" out of a circular piece and riveting the two lapped edges together. It was impossible to keep these tops and bottoms from warping during riveting and, in use, the bottom was apt to bulge up in one spot and sag in another.

The present construction reflects decided ingenuity in developing home-made machines which produce a one-piece top and bottom, die formed by reverse spinning (sheet and die stationary, tool rotating). To form the top or bottom, a flat circle is cut and placed on a die. A rolling die on an arm rolls round and round over the flat piece until the piece is formed to the contour of the die, which is the contour of the finished top or bottom. This spinning machine is power driven and hand pressed. The complete top and



Left—Polishing outside of tank with motor driven brush. The tank revolves slowly; the brush revolves swiftly. The brush and motor are screwed toward the operator by means of the cable wheel. Right — Using the same machine for inside polishing. Monday designed and built this grinder-polisher.



bottom are shown in one of the photographs.

After spinning, the edge is turned and crimped for the top and simply turned for the bottom. Each bottom is polished on the inside before it is welded into the drum. The top is not polished, but is cadmium plated by a Ft. Worth firm.

The drum of the tank has only one vertical seam which is electrically welded in a special jig which keeps the drum true during welding. The sheet—polished on two sides—is squared and cut by Monday and, after welding, the seam is ground down by a flexible shaft wheel and polished while the drum is held on a special jig.

The bottom is then welded to the drum and the weld ground down. The tank is then placed in a special jig which revolves the tank while another special grinding and polishing machine

buffs and polishes inside and outside. This set-up is shown in two photographs. The completed tank is uniformly polished inside and outside. The vertical seam on the tank is visible—it is polished but left built up on the outside for strength.

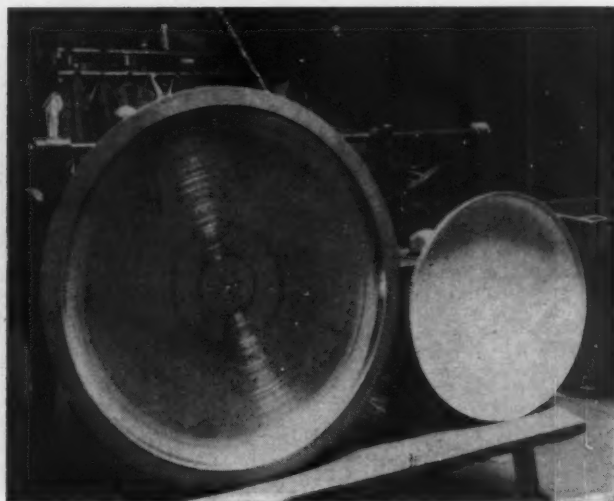
Monday makes these tanks in two types—a vertical tank as pictured and a horizontal tank with a top, man-hole type cover. The horizontal tanks are the least popular because they are not so easy to clean or use.

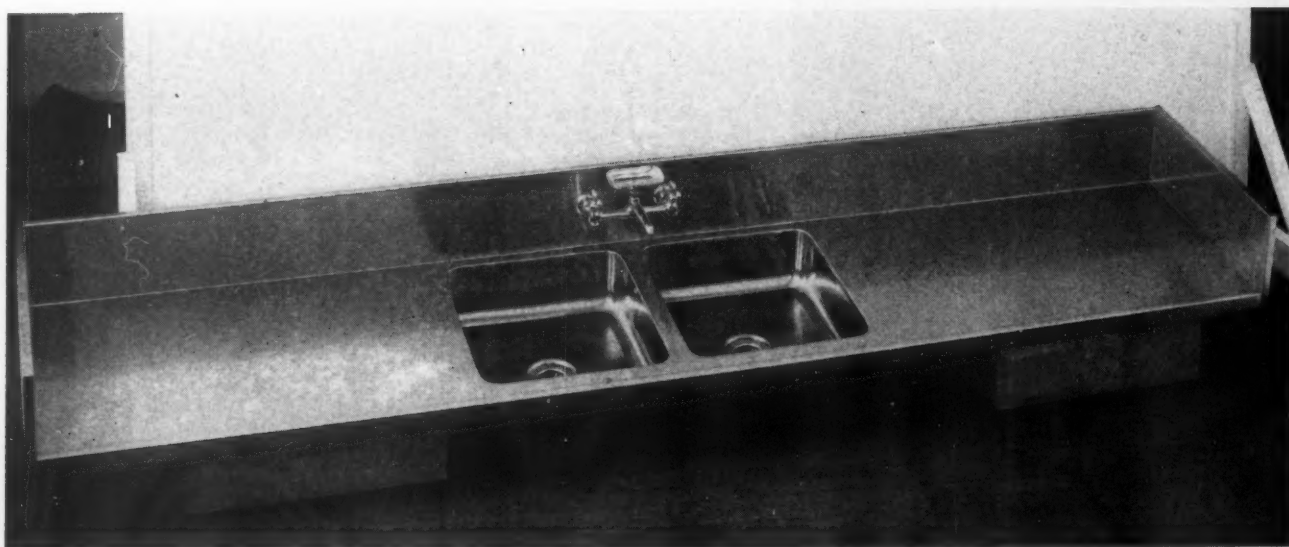
The vertical tank is supported by a fabricated base as pictured. The supporting ring is purchased already formed to shape. To apply the brackets which are sockets for the pipe legs, Monday has a special welding rig (shown in a picture) which holds the brackets exactly vertical to the ring during welding. This rig leaves the welder free to weld, knowing that the leg and bracket will be correctly placed and at a true right angle to the ring when the weld is finished.

Monday fabricates quite a few sinks and drain



Left—Welder welding leg bracket to tank base ring (see text). The Monday-made jig holds all parts in proper alignment. Right—Top and bottom of a tank after spinning in the reverse lathe (see text). The top is plated; the bottom is polished inside.





Above—Typical Monday-made sink. The bowls are purchased. Below typical “tailor-made” order with everything made to special dimensions. Monday sink surfaces are stiffened by soldering the stainless steel sheet to a 14-ga. steel plate perforated by numerous drilled holes. Text explains in detail.

boards. Sinks and drain boards, as a matter of fact, were made before the tanks and were the stainless steel items on which Monday developed his welding, grinding, polishing and fabricating technique.

Most of these sinks are made to special order—in other words, the sinks usually are specified to fit a certain space and are individually made up on order to predetermined dimensions. Early sinks were high polish stainless steel, but satin finish is now more popular.

Construction of Backing

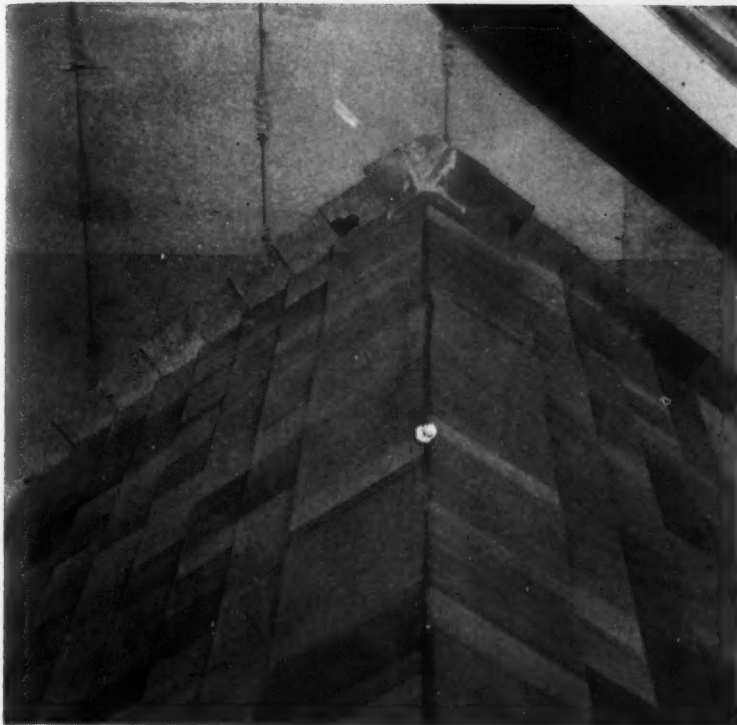
Practically all these sinks are 20-gauge stainless. While this weight of stainless is quite stiff, drain boards need some backing and Monday has done considerable experimenting to develop a composite top and backing which is sound deadened, has no ring, feels and sounds solid, and cannot be bulged. This quality is obtained by taking a stretcher-leveled, 14-gauge, steel plate and drilling numerous holes all over the plate. The plate

fits into the rimmed top snugly and the stainless sheet is soldered to the steel plate through numerous of the pre-drilled holes. This construction holds the stainless top tightly to the heavy plate at many points of contact and makes the stainless top as level as the plate. Where a back splash is specified, Monday always makes the back and board in one piece to eliminate a seam and a difficult grinding and polishing operation along an inside weld. The only inside seam is the joint between back and upright end.

The largest sink and work surface built to date was 34 feet long. It is three-sided, and is shown in one of the photographs. The tanks range in size from 27 inch diameter to 42 inch and from 24 inch height to 48 inches.

As this description and the photographs show, Monday, like other ex-sheet metal contractors, has been successful because of an ability to perfect shop-made machines or initiate satisfactory substitute methods for expensive die forming. And, of course, welding has made possible one-piece construction without die-forming.

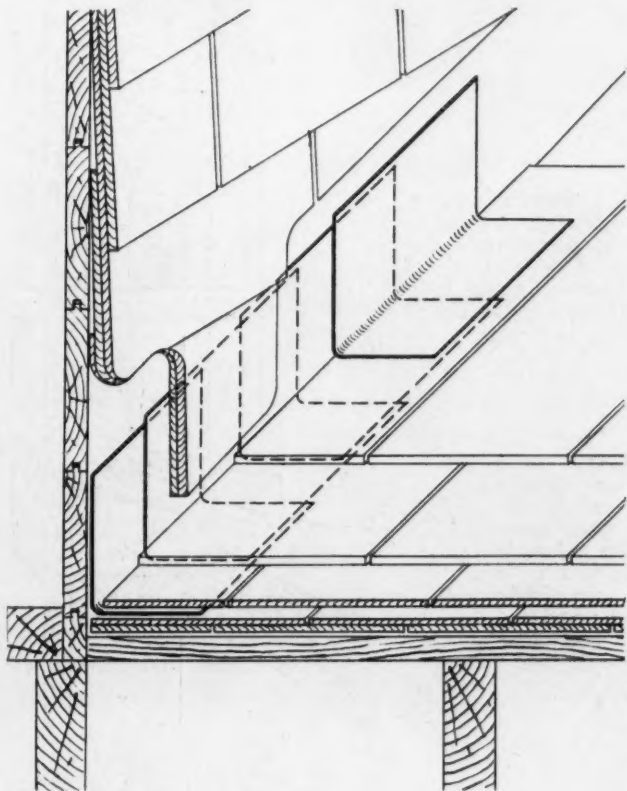




An Example of Proper House Flashing— with Lead

SITUATED in the lower foothills of the Berkshires, in Connecticut, the small home shown in the accompanying illustrations is one of the most interesting homes from a sheet metal standpoint to be built in many years. It was designed by Provoost and Everett, Architects, of Stamford, Conn., in Colonial New England style, and is full proof that small homes can be built in the low-price range, incorporating highest quality sheet metal installed by a legitimate sheet-metal contractor in accordance with the very best practice.

From the foundation to the lead chimney cap, all moisture-vulnerable intersections were flashed with sheet lead. Hard sheet lead was used throughout; that is, pure soft lead alloyed with a small percentage of antimony, which makes



At top of page — Lead flashing used at rising wall—gable end. Note the use of numerous, shingle length pieces rather than one continuous strip or longer pieces. In center—Loose-locked joint in a lead-lined gutter. The joint is filled with a non-hardening compound. Left—Detail showing recommended method of flashing a rising wall. Note size of pieces and way pieces are fitted into the shingles.



Left—Sheet lead hood fitted over a bay window. The back edge rises behind the lower course of shingles. The ease with which lead may be made seamless is especially favorable to applications of this kind.

the lead stiffer and allows 2½-lb. hard lead to be used where 4-lb. soft lead would ordinarily be employed. Since sheet lead sells by weight, this brings the cost of material down to the point where the recognized characteristics of lead—durability, beauty, and non-staining—can be obtained at an even lower cost than less advantageous materials. At the same time, installation cost is reduced.

Proper flashing is very important, for when

moisture seeps inside a house it can cause much damage. Cutting down on the quality of the materials, or their installation, may in some cases save the owner a few dollars on his original cost, but the contractor can point out that with such construction it is inevitable that within a very few years maintenance expense will be encountered.

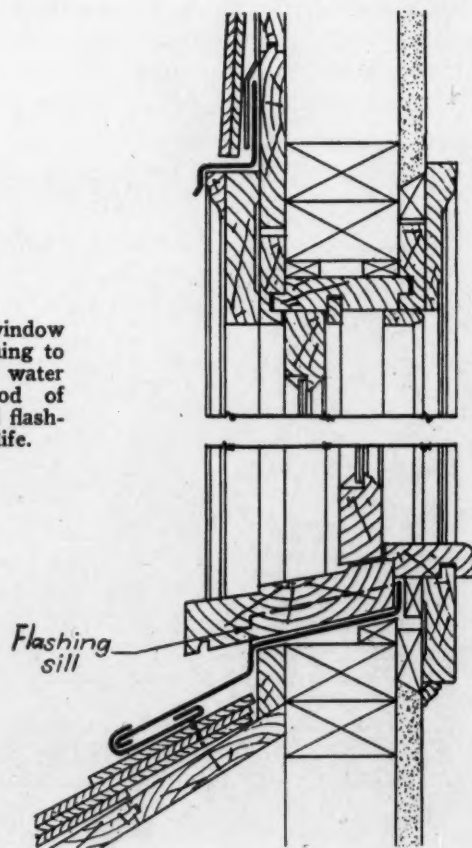
In this house there has been no cutting of corners. Flashing was applied liberally and correctly, and a detailed analysis should provide a good installation guide for future work and reference.

As indicated above, flashing was used in this house at a number of points where it should be, but frequently is not, found in dwellings of this price class—and even many expensive homes. Take window heads, for instance; they are one of the most common sources of leakage, yet in few houses are they ever flashed. Just a few dollars spent per home for window-head flashings may save hundreds of dollars for new wall paper or interior or exterior paint.



Right—Details showing window head and window sill flashing to insure protection against water penetration. Note method of locking sill apron. Careful flashing means long house life.

Left — Window head flashing (see detail) gives complete protection against water penetration. The edge is turned down to form a drip and completely cover the wood.





Lead chimney caps are easy to make; form a seamless cap; provide complete protection against water seeping between flue and masonry or into top of masonry.

Installation of window-head flashings on small houses, such as this, is a simple procedure. The flashings should run about 3 in. up in back of the siding and building paper and turn down about $\frac{3}{8}$ in. on the face of the trim. It is important that these flashings extend at least 2 in. beyond the frame on each side, running between the siding courses to prevent leakage at the corners, and gusset pieces should be soldered in at the corners where the lead turns back from the face of the trim to the siding. Door heads should also be flashed in the same manner.

Window sills should also be properly flashed if the joint between the framework and the sill is to be waterproof. Lack of flashing at the sills, especially where dormer windows intersect with a sloping roof, is almost as great a cause of damage as leaky window heads.

Sill, Wall, "Soaker" Flashing

Installing sill flashings presents no greater problem than head flashings. For the sills, the flashing is formed into a one-piece pan, with dog-eared corners, run through under the sill and turned up 1 in. along the sides and in back of the sill. In the front, the sill flashing turns down over the top of the siding or, in the case of dormers, has an apron which overlaps the top course of roofing not less than 4 in. It should be extended on each side of the sill in the same way as window-head flashings. Cleats should be used every 18 in. to keep the apron lying tight against roof and wall.

Side-wall flashing is another part of the home that is often neglected or improperly installed, and yet, here, too, is a place vulnerable to leak-

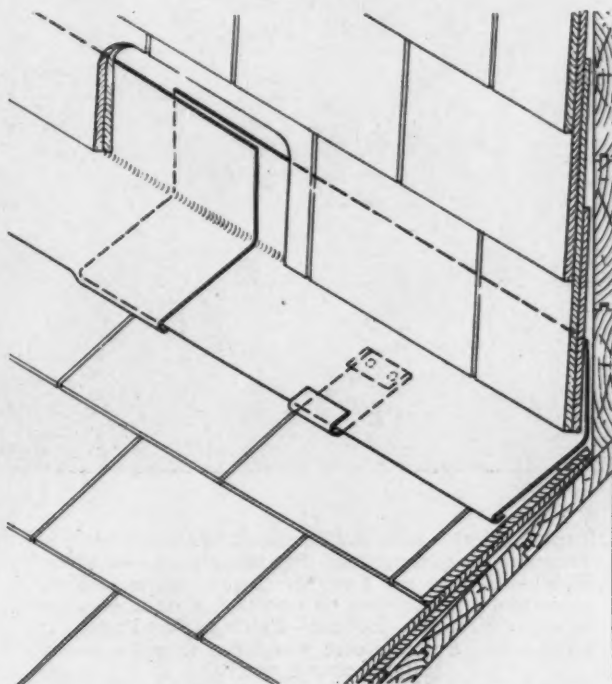
age. Side-wall flashings should be run in "soakers," small pieces interwoven with the roofing courses (except that with Spanish tile roofs a hidden gutter is used). Side-wall flashings should never be run in one piece, entirely under the roofing material, as was the case in one small home development visited not long ago, for this affords little or no protection for the client and will result in dissatisfaction with the contractor. When flashing is installed in such a way, the moisture and water has a free course under the entire roofing material. Furthermore, when you do the job right, it means more work.

The small "soaker" flashings for side walls should extend 5 in. out onto the roof sandwiched between roofing courses and 4 in. up behind the siding on the side walls. They are merely interwoven with the siding and roofing courses so they overlap each other at least 3 in., separated by the thickness of a shingle or slate.

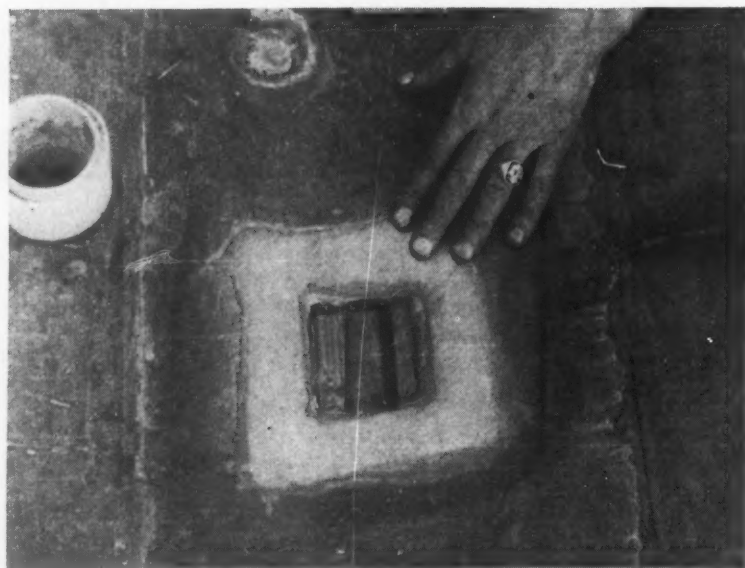
Gutter Construction

The lead-lined gutters in this home present another example of proper flashing procedure. Wooden gutters are a popular part of homes of this style. However, although often left untreated or just painted, for best service gutters should be lined. The lining may add a few dollars to the cost, but the prospect should be shown that the lack of necessity for yearly painting will charge off the original expenditure in a very short time. Also, no matter how well the painting is done, the protection will not be as efficient as that afforded by lining.

In installing gutter linings, the lead should be
(Continued on page 118)



Detail showing proper flashing where a pitched roof starts from a rising wall.



Top—Typical fissure and buckle in the valley copper. The splits were rough and thin like a hack saw blade. Middle—Copper cut away at fissure; edges cleaned preparatory to soldering on a patch. Note wide crack in wood sheathing. Bottom—Patch soldered over cut away hole. Extreme care was taken to get a water-tight, strong patch.

This Roof Failed—

*because the wood sheathing
was not smooth, tight,
seasoned and expansion
was not provided for*

By Lawrence E. Gichner

Gichner, Inc., Washington, D. C.

IGNORANCE stalks through the copper roof industry today. Ignorance accompanied by its bosom companion, "futile waste."

Those of us who earn our bread in the roofing trade know the correctness of this vigorous statement.

There is much theory, more conjecture and an infinite amount of guess—but too little truth and too little candid examination of facts.

In past articles we have discussed the problems of copper roofing applied over cement. Let us here turn our attention to the problem of copper roofing applied over wood, as illustrated by an actual example.

An Instructive Failure

The College of Preachers, at Mt. St. Alban, Washington, D. C., is an imposing granite structure of Gothic design. Here, from all over America, come the clergy of the Episcopal Church for post-graduate training.

These scholars learned, in addition to the Gospel teaching that "All blessings come from above," that there also comes from above most annoying drops of water, which anoint the head, peel the plaster ceilings and discolor the stone walls.

Humiliating to the manufacturers of copper and the sheet metal trade which applied the material is the fact that of the promenade tile, slate, slag and copper roofs on the structure, 95% of the source of all trouble was in the copper.

Why after only ten years' wear should the metal go bad?

Roofs on the cathedrals of Europe have lasted five and six centuries, we are authoritatively advised.

Some day, A. H. (After Hitler) I, as a sheet

metal contractor, want to examine these cathedrals. I want to crawl around on hands and knees and see just how, and how much, they have been repaired and replaced. I want to see how much of the original metal remains and in what condition it is. I want to find out if they have the same problems we have.

No Gold in Copper Roofing

Why must the roofs in America go bad after five and six years? Oldsters in the industry have a ready answer. They thunder condemnation against the material. "Copper isn't what it used to be. Go to any refinery and rolling mills and you can see them taking out all the gold, silver and platinum that was left in the old copper. With all these important ingredients removed, how can one expect the present day metal to hold up?"

There are many stories related of junk men who became immensely wealthy due to a heavy deposit of these precious metals found in old copper scrap which by good fortune they purchased. I accept these anecdotes simply as tall tales until I find that junk man who admits that such a stroke of good luck was his. Our concern has paid good hard cash to commercial chemists to analyze old copper for us. The reports show that the amount of gold in the copper is equal to the amount of tea you will find today in Boston Harbor.

Examining the Twenty-Fifth Annual Report of Kennecott Copper Corporation, just published for the year 1939, we find that at the five mining properties of the corporation in the United States and Chile, copper production totaled 763,509,698 pounds. Silver and gold recoveries amounted to 1,601,706 and 188,165 ounces, respectively.

Reducing these figures to proportionate pounds we find that in 76,016 pounds of copper there is one pound of silver and a much smaller amount of gold.

I am no metallurgist, but I question very seriously that even if this infinitesimal amount of precious metal were left in the copper it would add anything to the resistance qualities of copper.

Rarely have I found roofs made of 16-ounce copper giving trouble, where that trouble is traceable to the failure of the copper. In the greatest majority of cases, failure has been due to the incorrect application of the metal.

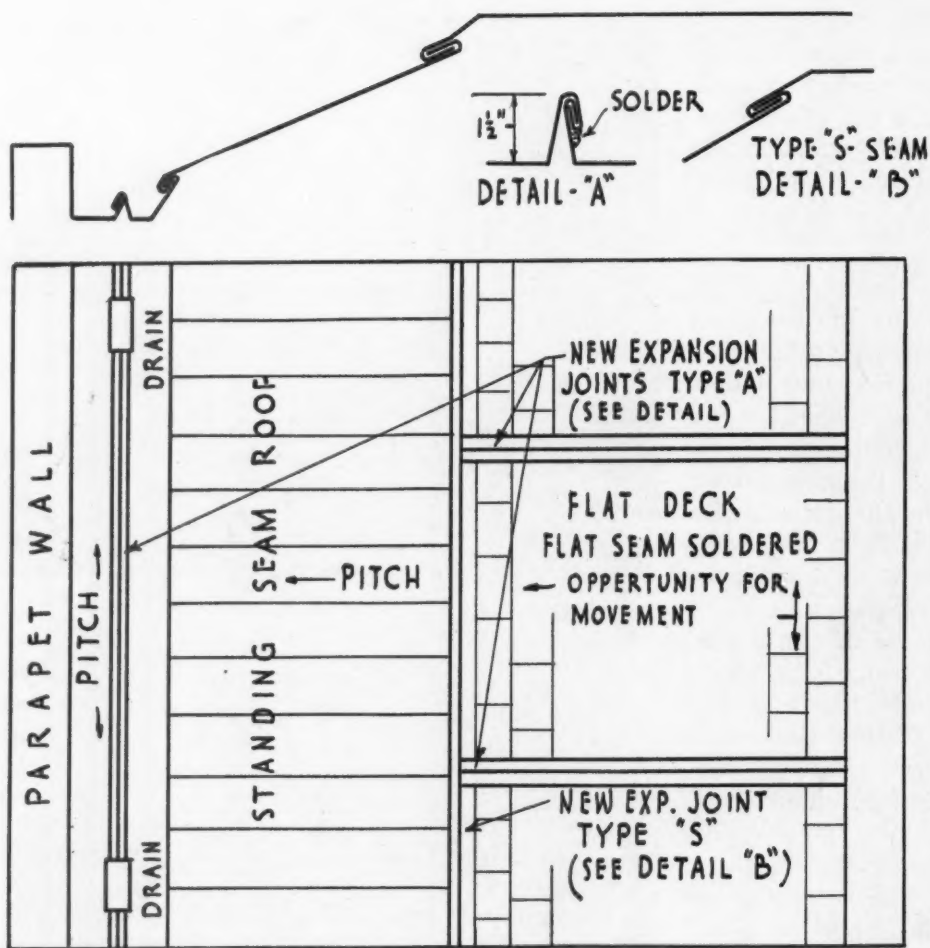
Abrasion Causes Failure

The worst job Gichner, Inc., ever had to repair, where copper was involved, was on a large, three-foot wide gutter which received the drainage from a tile roof of an express warehouse alongside our big local railroad terminal.

Cinders and soot covered the roof. During



Top—View of gutter before repairs. Note absence of any expansion joint. Middle—New expansion joint in place (at handle of snips). Note another crack in sheathing. Bottom—Large copper screen for drainage sump. So large that only extreme collection will clog screen.



Left—Details of roof reconstruction showing new expansion joints and types of joints used. Compare with roof plan opposite showing early construction without any expansion provision of any kind.

Below—Typical deck showing, in foreground, one of the Type "A" expansion joints. Deck sheets were opened, resoldered and properly sweated—which was not done previously.

ROOF AFTER EXPANSION JOINTS WERE INSTALLED

every rain these cinders were washed into the gutter. The tile were four to six inches above the gutter. The grit-laden water dripped onto the copper and by the process of erosion wore it to tissue paper thinness and perforated it with holes.

Some sections of the gutter had to be replaced completely where leaks had been disregarded and let go long enough for the underneath woodwork to rot. Other places could be patched. On some of these patched areas we experimented, using lead coated copper. Quickly the lead coating was worn off. This convinced us that it was no appreciable improvement over the uncoated material.

The error here was that copper should not have been used in the first place. The mistake was not with the metal, but with those who specified it for a service where by composition it was not intended.

Let us examine evidence in the College of Preachers job. Copper was used in valley gutters, decks, flashing and crickets. Investigation revealed that dozens and dozens of fissures had slivered the valley gutters. Previous repairs by others with plastic cement were of no avail.

These splits, ragged in texture and fine like

the teeth on a hack saw blade, extended in size from one to two inches. Located in strategic places over which rain and snow from the entire roof area drained, they permitted a considerable induction of water.

Simply cementing or soldering over the slits may have been the immediate step which hundreds of others would have taken in repairs, but our intense desire to know what the underlying causes and facts were, led us to pause, reflect and make a significant discovery.





Left—Opening in wall flashing due to surface soldering and no pre-tinning. Joint broke loose. Right—Crack in chimney cricket which caused considerable penetration by water.

In order to preserve these cracked areas for study, we cut out square patches of metal around them and to our amazement found that in the majority of places where we did this, the sheathing boards underneath were wide open. They were open in many places at least an inch. They were not split, but simply spread at the junction where they should have been driven tight against each other and securely nailed.

Immediately we combined these two facts. That where ever these fissures were in the copper there were also openings in the wood sheathing. That where there were openings in the wood sheathing there were also fissures in the copper.

Now which came first, the copper fissures or the wood openings, and which effected the other? Is the poor woodwork to be blamed for the copper failure? These things may have occurred to the wood. (1) It may have been green lumber,

which seasoned and shrunk. (2) It may have been well dried timber which was contorted by subsequent moisture. The moisture coming from condensation of hot air penetrating the unventilated attic and tightly closed-in areas beneath the roofing. (3) It may have been good lumber poorly applied.

We believe the third is what happened.

Reasons for This Failure

The copper exposed to the cold on the outside and a concentration of heat at the cracked wood spots underneath was subjected to an undue amount of stress and strain, at the particular points where it gave way. Weakened by an excess of movement, it tore.

Reasoning that our trouble started from the top, that is in the copper, we have this fact also to consider—that invariably many of our fissures occurred at an angle in the copper gutter where it sloped up to form the base flashing. (See Pictures, pages 72, 73.) Here again, due to the carpenters' construction, the underneath wood work was open and away from the metal.

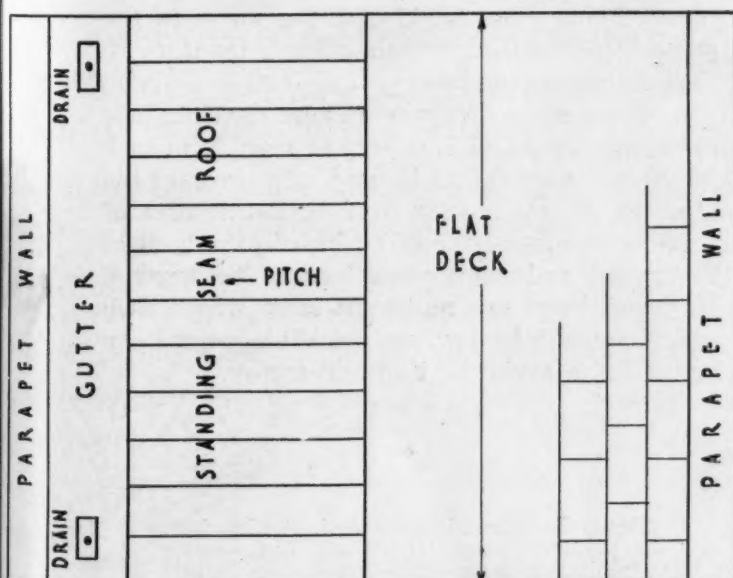
True, there was absolutely no allowance made for any expansion or contraction of the copper and, regardless of what the under conditions may have been, the metal would still have torn.

But in every respect this fact is important—that where copper is applied over wood, due to the movement of both materials, our problem is considerably more critical than where we have copper installed over concrete.

It is our belief that the failure of the roof on the College of Preachers was due to both poor wood installation and poor copper application.

The carpenter seemed to have taken a certain pride in making odds and ends of lumber, left

(Continued on page 120)



ROOF BEFORE REPAIRS NO EXPANSION JOINTS

Pipe Sleeves on Power Rolls Form Ribbed Facing

By Roch Braadshaw

THE California Sheet Metal Works, widely known in Southern California because of the unique, wordless sign (sheet metal man) on the front of its shop, has been experimenting lately on a method to simplify the work of making cornices, or curved ends for modernistic signs or buildings.

The present trend calls not only for curved sign ends and corners of buildings, but also requires that these ends, instead of being smooth, shall be composed of two or more raised surfaces, with recessed or indented surfaces between them. In making these ends out of sheet metal it is necessary to cut five or more strips, shape them and solder them together to produce the complete job.

The California Sheet Metal Shop has been using a method which eliminates the cutting and soldering. The ends and corners are made all in one piece.

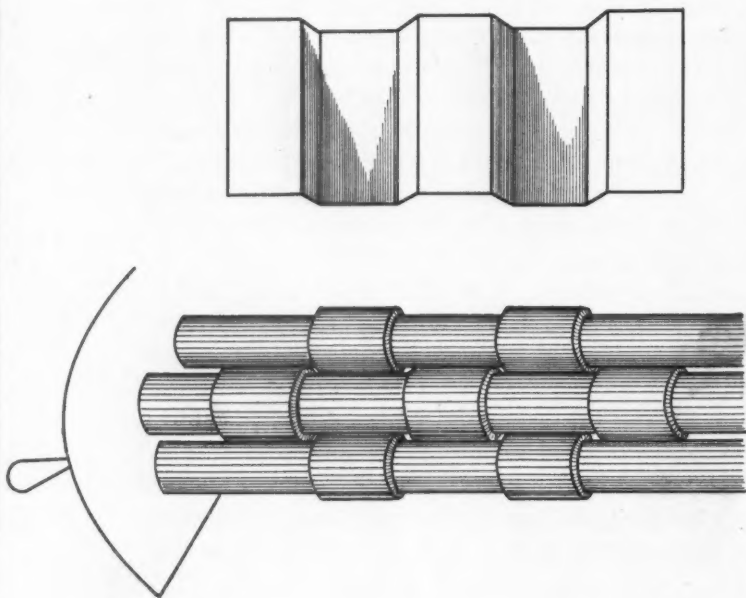


The raised surfaces are produced by a simple addition to the rolling machine. Pieces of galvanized iron pipe are cut the exact width of the areas which are to be raised and the areas which are to be indented. These pipes are fitted on the rollers in the proper position so that when a piece of metal is run through, the pipes create pressure at the desired points and shape the high and low surfaces in one operation.

This system has been used successfully on making curves with a large radius. On the smaller curves it has been found that the metal in the indented portions of the curve has a tendency to gather and form humps.

A good many corners require indentations three-quarters of an inch deep or more. On such jobs this method cannot be used, of course, for the pipes on the rollers will produce a difference of only about one-quarter of an inch in the level of the raised and sunken portions of the curves. However, there are numerous cases where such effects are satisfactory, and here this method can be used at a saving of time and money.

Above—Sheet metal men are silent advertisers for California Sheet Metal Works. Left—Power rolls fitted with snug pipe sleeves (can be held in place with set screws) and an example of the ribbed facing produced. Numerous variations are possible by varying the sleeves.





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BOOKKEEPING — *Where Is Your Money?*

By Joseph G. Dingle

C. P. A., Ottawa, Ill.

Article 1 (June) sought the reasons why business men refuse to study or discuss bookkeeping. Article 2 (July) explained why bookkeeping is vitally necessary in today's conditions. This article explains that money is only the lubricant for business transactions and, in itself, means little in business conduct other than being a measuring stick whereby progress is ascertained. Before concluding, we will present a complete bookkeeping system for 1940 requirements.

YOU may think we are rather impertinent when we ask you where your money is, but we will bet dollars to doughnuts you cannot answer our question correctly. You will probably say you keep it in the safe, or in the bank, or both, if you have enough to cover both places. We say to you, you have money scattered all over your shop, even all over town. You may have some cash in the safe; you probably have some credits in your account at the bank; we are quite sure you have some money in equipment and merchandise in your shop, as well as accounts receivable and notes receivable. Unless you are the exceptional fellow, you have even a few I. O. U.s bearing the names of some of your down and out friends.

When Is Your Money Yours?

Money, to the business man, is represented in many forms, and is in constant motion. You begin business with a bank account, which may contain all your life's savings to that point, and perhaps a little borrowed from a friend. You proceed to take that money out of the bank, fix up a shop, install equipment, purchase an inventory of materials and supplies, and before you realize it, your money has gone from the bank into many other places, each a little harder to keep up with than was your bank account.

As long as your money remained in the bank, nothing could happen to it unless and until you signed a check. It was absolutely at a standstill. When you fixed up that shop, you found you had placed your money, your capital, into property of a type which might be destroyed by fire or windstorm, so you had to take some more money and buy insurance to protect that which was in equipment and merchandise.

When you put your money out where the tax assessor could see it, you had to dig up some more to pay the taxes on it. After fitting out your shop, and getting in a stock of merchandise, you had to take some more money and hire men to help you use that merchandise; that equipment, in order that you might keep it turning over and thereby earn a profit. For every dollar you have in merchandise, you have several dollars in equipment, expense items, and accounts receivable.

Do You Protect Your Money?

What are you doing to protect your money that is scattered all over town? That which is in your shop is protected at night by a lock on the door, and during the business hours, some one is always present to see that no one walks out with a few hundred dollars worth of property. At all times you have it covered with insurance against fire. So long as this property stays in your shop, you may say it is fairly well protected, but what about its protection after it gets out to the customer.

Here it has changed its form completely, in fact instead of being property of the character you assembled in your shop and installed in the customer's home, it has become an intangible thing, a debt owing to you by your customer. The actual possession is in the customer, and except for the material man's lien, you have no claim against it. You have a right to receive a certain sum from your customer, and this is not so easily seen as is the merchandise as it stood in your shop. You should have a simple, yet complete, accounting procedure that will protect this money you have in accounts receivable. You should be certain that all such items are properly recorded at the time the sale is

made, and that all payments or other credits are properly applied.

What are you doing to protect the money you have invested in the hours of labor that your employes are putting in on the several jobs now being worked on? You will probably answer that you sold the job at a certain price and will get that for it when completed. That's true, but what about watching the amount of money you put in for labor? You estimated a certain amount of labor to be necessary to do that job and unless you can keep that cost within your estimate, the excess most assuredly will come out of that part you intended as profit. So far as the total amount you will receive for the job is concerned, that is fixed at the price you quoted the customer and you will not be able to go to him when the job is finished and say that due to some reason the labor cost was in excess of your estimate and you would like him to pay that excess. You know, and I know, he will stand on the contract price and you will be without argument.

The time to safeguard that money is as the work is progressing. Of course, if you were in error in your estimate, you will have to pay the boys for the time put in and absorb your

loss; but, if because of the thousand and one things that can happen to a job, your boys get lost and have to tear out and replace work, that is money lost to you. Keep the job under control at all times and try to avoid errors. The boys are doing the best they can, and yet they may misread a blue print, or take a wrong measurement. A little help from you will be of material assistance, and in the end you will be protecting your dollars.

What steps are you taking to make sure that the materials which you have bought and paid for—put your money into—are being charged to the party or parties who get them? That is money in another form and unless you charge the material out as it leaves your shop, there is great likelihood that it will never be charged out. We have already discussed the safeguarding of the money after it has been charged to the customer. We are now talking about the actual charge as the material leaves your possession. Two or more men may be on the job and each may think the other has made a material ticket for the materials taken when, as a matter of fact, no one has done so. There goes some of your money and it may never be recovered.



Every contractor should put the "magnifying glass" of close, impersonal scrutiny on his methods of keeping and using cost records. Proper use of records will insure protection for the vital transactions which make profit or start the business on the road to bankruptcy.

What steps are you taking to safeguard your money that is flowing into expenses? Are you getting the most out of your advertising? Are you getting the most out of your truck, or are you letting some minor repair wait until you will have to make a major repair? That minor repair if caught in time can save you money. We could go through the whole category of expenses and point out ways of conserving your money, but you will get the idea. Expenses are money, regardless of the nature. They must be safeguarded and included in the total of the sales to your customers.

You Must "Check" Your Estimates

What steps are you taking to check yourself on your estimating? Here is one place where you can really throw money away. Just be a little over-optimistic in your ability to get a job done without spending money and let that show up in your price to the customer and you will really be careless with your money. After carefully estimating a job, you certainly owe it to yourself to see what the actual costs were, item by item as they appeared in your estimate. Having found the places where you were wrong in your estimate, you can take the necessary steps to avoid repeating those errors again.

Just because you estimated, or shall we say "guesstimated," a job to cost a certain amount is no proof that it did cost that. Actual cost records will show you things you ought to know. You can lose money by underestimating the cost of a job. Of course, if you do this and land the job, you will be giving the customer something for nothing—in other words, you will be giving him some of your money.

On the other hand, let us assume that you have overestimated the cost of the job. Unfortunately, you may never know what it would actually cost, because some other fellow will get that contract. You will, in this case, have lost the time and effort put in figuring the work and, in addition, you will have lost something of an intangible nature in letting your prospective customer think you are too high—too unreasonable in your profit grabbing.

A customer never thinks that the low bidder is taking the job at a loss. It is always the high bidder who is asking too much profit.

What steps are you taking to protect the money you are actually spending for your living? Are you attempting to keep that expense within your income, or do you allow it to take care of itself? In this, we can give an experience from real life. Some years ago a certain business man, who, we must admit, had some rather exalted ideas about his own ability and who, like many mortals, was ever ready to show

himself off to the best advantage, was told by his so-called accountant that his profits for that year were, say, \$12,000. The usual figure had been around \$4,000 to \$5,000 per year.

A Horrible Example

There was something about that \$12,000 that pleased this gentleman. Unlike the \$4,000, or \$5,000, \$12,000 was One Thousand Dollars a month. That's round money in anybody's language. Our gentleman, now being a man of \$1,000 per month income had a real responsibility and he rose to the occasion. New clothes, new automobile, and a much bigger diamond in his lodge ring, in fact an entirely new ring and a real beauty. After several months of real \$1,000 a month spending, this poor fish wondered why he did not have enough money to meet his pressing bills and, in a short time, the end came and he was rudely awakened.

A single question put to his so-called accountant would have saved all this, but the question was not put, therefore not answered. That question would have been, "If I made a \$12,000 profit last year, where is it?" The so-called accountant could not have placed his finger on that \$12,000, simply because it did not exist. This discovery would, no doubt, have brought out the fact that there was a serious error in the profit and loss statement and the increase in net worth did not support the profit there shown.

You know and I know that if we made \$12,000, we would have it, or would have spent it—outside the business. You too, may be one of these fellows who likes to show all kinds of prosperity and not worry about your ability to back it up with profits from your business. If you are, you, like our friend above, will wake up some day and learn too late that your flight into real profits was short-lived. You should know your earning capacity before you spend in excess of it. No one ever got into much trouble by spending a little less than their income. On the other hand, one cannot last long by spending more than their income. Your bookkeeper can help you out on this, if you have the right kind of insurance on his kind of money.

We believe we have opened your eyes to the question of your money. You may have a very substantial bank balance *and yet have no money that belongs to you.* Your bank balance may represent unpaid bills, many of which are long past due and if that be the case, you have no bank balance. We like to remind business men that only a small part of the actual money that passes through their hands is really their own. The vast majority of it belongs to the other fellow, either

(Continued on page 116)

The PROBLEM CORNER

Tank Bottom Distortion

American Artisan:

We have built many stainless steel cheese vats and vat linings, up to 20,000 pounds capacity, usually of 20-gauge steel and are trying to find ways and means of eliminating traces of waves and buckles, due to soldering heat absorption.

We have used all standard methods of chilling the seams. Though we use a lap riveted reset seam down the center of the field of the bottom (sizes range from 54 in. wide to 20 ft. or 24 ft. long) we get no distortion whatever as a result of our present control of riveting itself. We have used a heavy copper chill bar with adequate hold-down and also wet pads adjacent to the seam, but we are not satisfied.

We would like to know if chilling is the right method. We wonder if warming up the entire body of the vat, electrically and uniformly would eliminate waves and buckles. Has this ever been tried? We would like the best recommendations for sweat soldering a field of this size. There is no particularly advantage to us in welding the seam and we do reduce cost by soldering.

H. B., Wisconsin.

Reply by
The Editors

We do not feel qualified from a practical standpoint to offer suggestions. We can, however, submit your question to several Chicago contractors and ask their suggestions. We can also transmit your problem to the service departments of stainless steel manufacturers.

(Editor's Note—Only one Chicago contractor had any comparable experience and his tank sizes were far short of the reader's specifications. His only suggestion was the use of the best flux available and a commercial 60-40 stainless steel solder.

Reply by
American Rolling Mill Co.

Our Research Department has not done any work on the problem of raising the temperature of the entire body of the stainless steel vat to approximately the temperature necessary for sweat soldering, but they say it sounds like a good idea. Of course, this would be a sizable problem in vats as large as your reader is fabricating.

The reason waviness or buckles develop in this type of fabricating is—The metal adjacent to that being soldered is raised to a temperature where the expansion causes it to become permanently deformed. Three methods are suggested to alleviate this.

1—Use a material with a slightly harder temper than now used. 2—Use a softer solder so there will be less heat differential between the material being fabricated and the melting point of the solder. 3—Use a large soldering iron; watch the work carefully and do not heat the work any more than absolutely necessary.

Reply by
Republic Steel Corp.

The use of chill bars to hold seams for soldering after first obtaining physical strength by riveting is sound practice. Stainless steel from room temperature to soldering temperature has a high coefficient of expansion along with low heat conductivity. This makes warpage hard to control, especially where seams have already been tied in position not allowing for expansion and contraction at the joint.

In this problem we have the inherent physical characteristics of 18-8 to contend with as soon as heat is applied and we also have strains set up by riveting operations which are relieved by soldering heat, thus tending to warp.

We have tried the suggestion of pre-heating the bottoms of smaller tanks and liners with no success. In some cases we were worse off than when we did not pre-heat. Best success seems to come from getting rid of the heat as quickly as possible and inducing as little heat as possible from the soldering torch or copper.

Reply by
Borg-Warner Corp. Ingersoll Steel & Disc Div.

The reader evidently has used all acceptable methods at his disposal. In our opinion it is almost impossible to solder light gauge stainless steel in large sections without expecting some of the distortion he is experiencing. It is our opinion that welding would be a more successful method providing the reader can properly pit up the job with jigs, etc. It has been demonstrated that labor costs are lower for welding than for soldering and there is less distortion.

In order to make a welded assembly it has usually been necessary to use 18 or 16-gauge which, of course, is higher in cost. However, the customer's reaction to the increased cost has usually been favorable due to the better service obtained from welded construction and heavier material. In our opinion, soldering construction has never proved satisfactory on such large vessels which are subject to temperature changes which, in turn, causes failure in soldering joints. When the expense of making one or two repairs on soldered construction is considered, it is usually found that the welded construction actually costs less as a long term investment.

Built-In Gutter Leaks

American Artisan:

One of our churches, built about twelve years ago, has a concrete tile roof of about $\frac{3}{4}$ pitch. Along the eave there is a 16-ounce copper gutter of the built-in type. Each such gutter along the main auditorium is about 100 feet long. There is no allowance for expansion. The gutters have a girth of 30 to 36 inches. Each year there are six or more cracks to solder. Can we remedy the trouble or ought we fill in the gutter and continue the tile to the eave?

W. P., Ohio.

Reply by
The Editors

We fear that the trouble with your copper gutter is due to a lack of provisions for the expansion and contraction. There is nothing wrong with a properly constructed box gutter, but difficulty is frequently encountered where the metal is nailed into the gutter or there are no expansion joints, which we believe is your trouble with a gutter 100 feet long and no expansion joint.

We believe it would be more satisfactory and perhaps easier to repair the box gutter and install proper expansion joints than it would be to fill the gutter and hang a gutter.

We are sending a copy of your letter to Copper and Brass Research Association, asking them to send you a copy of their hand book "Sheet Copper" which tells all about copper gutters and other copper work. Probably someone in the association will be glad to offer you definite suggestions for your particular job.



At left—Exterior of Stanfield's shop showing brightly painted sign and metal front with jackass trade mark in the window. Ralph Stanfield stands outside. Below — Shop-built truck body with steel cab, racks for ladders, compartments for tools and space for materials.



By Geo. H. Watson

Advertising Ideas of a Southern Contractor

A JACKASS in full flight represents the trade mark of the Birmingham Tin Shop, 3710 5th Ave., Birmingham, Ala., and is expressive of the novel advertising methods used by this concern.

Quite a large size model of the long eared beast is kept "hitched" in front of the shop and although it brings a lot of "hee haws" from people as they pass by, enables them to remember that this is a sheet metal place of business. This model, built by Clyde Stanfield, son of Ralph Stanfield, proprietor, has moveable parts, so that the jackass is placed in various poses to the amusement of passers-by.

The emblem of the jackass also graces the sides of the concern's delivery trucks. One of its trucks is as noteworthy as the trade-mark in that it has a novel body built by the same Clyde Stanfield. He purchased an old 1926 Dodge sedan and built an entirely new streamlined truck body on it with turret top and all; in fact this concern had a turret top car before solid steel tops appeared on pas-

senger cars.

This truck has all facilities, including a trap door for the charcoal firepot, a rack across the top for delivery of long, heavy pieces and other storage compartments.

The front of the concern's place of business is also noteworthy in that it was built of sheet metal and done in a brilliant hue of colors. The letters in the sign "Birmingham Tin Shop" are put on by metal screws and can be removed for repainting as well as for painting of the background.

Ralph Stanfield founded the concern in 1921, having removed from Florence, Ala. His first job was to build a drip pan for an ice box in the Tutwiler Hotel for which he charged \$2.50. He has been doing this concern's business every since. Besides his novel advertising methods, Stanfield has seemed to build business through satisfied customers, one satisfactory job begetting another.

The concern specializes chiefly in ventilating and gutter work for large industrial plants of the Birmingham district.



By Fred E. Kunkel

"Coupons"

Reward Customers who Secure Prospects

FOR the last two years Perry Patteson, sales manager of Modern Home Insulators, Inc., in Washington, D. C., selling stokers, home insulation and "stone fronts," has consistently used the coupon bond idea with astonishing good results.

This is a regular printed form of certificate entitled "Profit Earning Plan" and covers ten coupons worth five dollars each. After the firm sells a job and the customer signs up, Mr. Patteson writes him a personal letter, thanking him for the order and encloses a coupon bond certificate, telling him that here is a chance to make fifty dollars. If the customer turns in ten names of real live prospects who can be sold, he gets five dollars for each name, payable in cash at the office.

"Our coupon idea has produced a lot of business," explained Mr. Patteson. "In fact, more than fifty per cent of our prospects were turned in by satisfied users in one year, which to my mind proves that we are doing a good job because

at least sixty-one percent of our new business came from actual users.

"Each year we also send out a New Year Greeting Card to every past customer on the books, wishing them a happy and prosperous New Year, and ending up by calling their attention to the fact that for every prospect turned in, whom we subsequently sell, we will pay \$5 cash.

"And each year since we started this idea we have the names of many prospects turned in, as customers are anxious to make a little extra change. We immediately follow up all these leads and make sales where we can. This furnishes many valuable sales prospects to our five salesmen on stokers and the eleven salesmen on insulation.

"Our salesmen have gotten so they look for these coupons in every mail from their customers. They realize that the customers who have sent them in will gladly recommend and assist in every possible way in closing the sale. When we checked

up on the number of prospects received, in comparison to the number of jobs actually sold, we found that sixty percent of our total sales came from coupon bond leads. The more jobs we sell, the more prospects we have coming into the office via the coupon bond idea. In three years we have sold more than 3,000 jobs.

Satisfied Customer Best Salesman

"In my opinion sales managers of a great many organizations spend a lot of time and effort in training good salesmen, but I believe it is impossible to find better salesmen than our satisfied customers. Of course, every customer is not a salesman. Occasionally we run across a user who is not pleased with his job. This gives us an opportunity to make it right. The customer, finding us eager to do the right thing, becomes satisfied

with our guarantee and so recommends our organization to his friends.

"When these tips come in, the salesman looks in the city directory for the type of business or occupation of the prospect, and tries to find out the type of fuel burned, plus any other data he can obtain before actually calling on the prospect. When he is ready he tries to make an appointment. If this does not succeed, he goes out later cold-turkey. We strongly recommend the phone call, as we find that frequently names will not turn out to be even 'good suspects.'

"We used to mail checks for coupons every thirty days with a good-will letter. But we found that if we gave the salesman the \$5 check, to take back to the party who mailed in the coupon bond, the customer was so pleased that they tried hard to secure additional prospects."

"The Chump"

Reprinted by permission from "The Tipster," house organ of LeValley, McLeod, Kincaid Co., Inc., Elmira, N. Y.

This story concerns a young man living in a small city. After some thought he concluded that as heating was a necessity and in view of the rapid strides being made by the industry, that it offered excellent opportunities. So he started in the Heating and Winter Air Conditioning Business.—The Poor Chump!

He didn't realize that men with years of experience in the business had found that the heating business was the only one which had any troubles and the thing to do was to get into trouble free sidelines which required no service such as washers, refrigerators and radios.

Having once started the young man stuck persistently to his business. He subscribed to two trade papers and actually read them. He even went so far as to take advantage of the free sales helps offered by the manufacturers whom he represented. The Chump didn't realize that manufacturers literature was great for warming the shop on chilly mornings and so he had it distributed to the homes.

He wasted more time by keeping a set of books which told him what each job cost. He didn't realize that it was more sporting to guess on this point. He was so inexperienced as to even admit that he had an overhead and still more foolish to allow for it in his quotations.

When agents from a mail order house located in a nearby city canvassed his town, he listened to their story. He hadn't yet learned that it was more profitable to sit in the shop and gripe about it and was so demented as to think that people would rather do business with a local man. So he made a few improvements in their story and tried the

same thing. He found some good prospects.—Some Luck!

When he made a survey he made careful measurements of each job. The poor Chump would never learn that the way to impress prospects was to give the house a hurried look and quote a price on the spot.

When he returned with his proposal and he was told that his price was too high, the Chump didn't know that he should either cut his price or leave. He had the nerve to sit there and explain what he was going to give them for the price he asked. He was too inexperienced to know that prospects didn't want to hear about Comfort, Convenience and Cleanliness and so he had the crust to tell them about these three points and strangely the prospects actually listened.—More luck!

But he showed the most nerve when upon completion of his presentation he had the crust to ask for the order.—Some Nerve! Then right under their noses he drew up a contract so there could be no misunderstandings and asked for their signature. Some Actually Signed!—Just Luck—

When customers called and made a complaint, the Chump didn't realize that customers complain for fun. He thought that perhaps there was something wrong and even went so far as to go to see for himself.

At the close of the year, he had showed a profit. The Chump took time off and went to the National Convention to get the latest information on new developments and equipment, so he could give his customers the latest and best. Some people are just born lucky!—The Lucky Chump!!

*You can
fix up your
HOME
for*

Beauty

Protection

Comfort

TO *Modernize* TO *Repair*



FHA
ASK FOR DETAILS
PAY-BY-THE MONTH PLAN

*You can
fix up your
HOME
for*

Efficiency

Livability

Convenience

FHA's 1940 Modernization Campaign

WITH an eye toward stimulating new fall business, the building industry is laying plans for a drive this summer to promote property modernization and repair, with emphasis on "pay by the month."

The nation-wide campaign, with the full co-operation of the Federal Housing Administra-

tion, is planned to break simultaneously in all sections of the country in mid-August. The new drive, patterned closely after last summer's similar and highly successful campaign, will again stress "Fix Up Your Home! Modernize," and convenient monthly payments on the FHA Plan of installment buying will be featured.

Manufacturers and dealers who tied in aggressively to last year's drive found that many modernization jobs can be closed and new prospects developed by featuring FHA-insured (Title I) loans. Federal Housing Administration figures show that about 3,000,000 of these modernization loans have been made to date. That means something like \$1,100,000,000 worth of property improvement already financed on the FHA Plan.

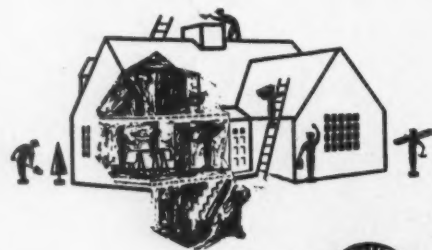
FHA officials think the possibilities of volume modernization have only begun, since applications for loans seem to be steadily rising and at present average about 10,000 a week. This increased activity indicates that the public and the lending institutions are coming to realize and avail themselves of the benefits offered by the FHA Plan. In line with this trend, FHA is again preparing literature and display material for the trade. This will be available at headquarters in Washington, or through FHA's 64 field offices, about the middle of August.

The material includes a colorful window display and a cleverly illustrated booklet with a check list for home owners. A mimeographed piece will describe how dealers can develop and handle business under the "Property Improvement Credit Plan," Title I of the National Hous-

(Continued on page 114)

*Convenient Monthly Payments
Will Help You*

MODERNIZE



ASK
FOR
DETAILS



FHA Pay-by-the-Month **PLAN**

Association ACTIVITIES

Pennsylvania

At the annual meeting of the Sheet Metal and Roofing Contractors Association of Pennsylvania, held on June 13 and 14 at Harrisburg, the following officers were elected for the coming year:

President—A. J. Sabathne, Altoona.
1st Vice President—J. D. Sprucebank, Jeannette.
2nd Vice President—H. W. Morris, Carlisle.
Treasurer—Harry Hartline, Erie.
Directors—R. S. Hahn, Easton, and L. A. Luckhardt, Pittsburgh.

Illinois

The Legislative and Executive Committees of the Sheet Metal Contractors Association of Illinois assembled in Peoria—June 29, 1940—and selected Peoria as the place and January 15-16, 1941, as the time of the annual meeting.

Promotional activity tending to put the business on a higher plane and rendering a better service is the ultimate goal.

J. C. McMackin, Secretary, Salem, Ill.

Florida

The Florida Roofer, Vol. 1, No. 3, published July 15 by the Roofing and Sheet Metal Contractors' Association of Florida invites their members to send along any news for the benefit of the association, and calls attention to the publicity given the Florida association by the roofing and sheet metal trade journals.

The Florida Industrial Commission offers co-operation to acquaint employers and employees with safety, also with the provisions of the Florida Workmen's Compensation Act and the Florida Unemployment Compensation Act.

Members are urged to organize their own city and work for fair competition.

The names of shops paying dues for 1940 are listed.
E. M. Fillingham, President.

Fox Valley, Illinois

The sixth annual field day of the Fox Valley Furnace and Sheet Metal Contractors Association was held at "The Farm," four miles west of St. Charles, July 17, 1940. This proved an ideal location—beautiful shade trees, ¼-mile race track, baseball diamond, horseshoe pitching courts, plenty of parking space, a fine dining room and two bars.

Members, guests, jobbers and salesmen made up the 50 who sat down to dinner.

George Bushman of Aurora supervised a very spirited horseshoe pitching tournament which was won by our past president, Fred Nolting and Mr. Delloto of Associated Heater Parts. The cup will be held for six months' periods by the two winners, who will return it to competition next year. Nolting and Delloto also received individual prizes.

Attendance prizes were won by Walter Kruse, a member, and Charles King, a guest.

Everyone was sorry that John Sheets and Reid Mackin, two old friends of our members were unable to stay to

dinner. They left early to start on a two weeks vacation with the well wishes of friends ringing in their ears.

Short talks were made by Ray Lorenz, John Scheets, Jr., Ed Niemec, John Novak and Ed Carter. Laurie Walquist, former All American at the University of Illinois and star member of the Chicago Bears, was introduced and spoke a few words.

The committee in charge—Conover, Ries, Lamp, Klinken and Bushman—were voted thanks.

Jack Stowell, President.

Rochester, N. Y.

The Sheet Metal, Roofing, Heating & Air Conditioning Contractors Association of Rochester, N. Y., held their 55th annual outing—a cruise to Cobourg and return on the Steamship Ontario to Canada—on July 18th. Fifty-two contractors and jobbers made the trip and everyone said it was the best picnic they ever attended.

The deck sports were amusing and kept the boys busy most of the day. We had a hot ball game in Cobourg between the dealers and jobbers.

On returning to the United States, some of the men had a little difficulty convincing the immigration officers that they were not 5th columnists, otherwise the affair ran very smoothly.

We had good weather, excellent meals aboard ship and everyone returned rested and sober.

The committee consisted of Elmer Davis, Richard Friday and Burton Stevens.

Burton P. Stevens.

Wisconsin

The District Meeting of the Wisconsin Sheet Metal Contractors' Association was held at the Miami Club, Highway 113, near Madison on July 13th. The meeting was called to order at 3 p. m. in the presence of the Board of Directors and members—the attendance at the close of the meeting registered 23.

Chairman C. F. Wolf of the Legislative Committee, reported considerable sheet metal work on some State projects and that the State Control Board was giving consideration to having the work performed by prison labor. Much discussion followed and finally it was decided to leave the matter in the hands of Director Wolf and Member Schomann and they were authorized to obtain the assistance of the Specification Committee of the Milwaukee Local, who were actively working on the matter.

Chairman Schaar of the Warm Air Heating Committee addressed those present on the importance of selling and advocating warm air gravity installations. He explained a material sheet which he found useful to obtain an accurate material list for each job. He distributed mimeographed copies.

National Director van Lannen reported the latest information on the National association. He read a proposed Code of Ethics prepared by National Secretary Bitter, which appealed to those present and it was decided to have copies made for each member in good standing, after adopting without a dissenting vote. He also reported that National Director Boneright organized a Nebraska State Association.

Association Activities

The chair mentioned the death of R. F. Jeske of Milwaukee and requested those present to stand a minute with bowed heads out of memory and respect.

At the close of the business meeting the chair turned the meeting over to Paul Krueger of the Madison Local. Mr. Krueger introduced the first speaker, Harry A. Nelson, Director of Workmen's Compensation & Public Liability Insurance, of the Industrial Commission. Mr. Nelson discoursed on the general principles of this particular Wisconsin law. He answered questions at the close of his talk.

Henry F. Kaiser, representing the Employers Mutual of Wausau, addressed the meeting on Contractors Liability, going through his subject and explaining the various coverages under the liability insurance. The talk was followed by questions and answers. Mr. Kaiser distributed forms on Contractual Public Liability and Manufacturers and Contractors Public Liability.

The meeting adjourned at 5:10 p. m. and the Madison members invited all to participate in a repast with refreshments.

The next district meeting will be held at Two Rivers on August 17, in accordance with an invitation given by Past President R. G. Suettinger and Bill Brueckert of Frank Kerscher Company of Manitowoc, Wis.

Paul L. Biersach, Secretary

Chicago

The Furnace, Air Conditioning, Sheet Metal Institute held their summer educational meeting at Rhinelands Hall, 3159 Southport Avenue, on July 25th.

Preparations were made for fall educational meetings—educational information on stokers, oil burners and controls. Bill Ufer of The Mercoid Corporation will conduct the educational program for fall and through the winter months on controls.

Dan Quinnan of The Fireline Company, Chicago, led the discussion of the evening devoted to the 1940 business outlook for the furnace and sheet metal contractor.

The Furnace, Air Conditioning & Sheet Metal Institute held its annual picnic recently at Long Lake, Illinois. The picnic committee headed by John Novak outdid themselves in providing entertainment and activities for those in attendance. The day was beautiful. Races, games and prizes for the winners made the affair a success.

Louis E. Dreihobl, President.

Chicago Golf

The Chicago Warm Air Golf Association held their July meeting at Indian Head Golf Club, Joliet Road (Route 66) and Wolf Road. The attendance was unusually good and all enjoyed a very enjoyable afternoon.

Ray J. Lorenz, Secretary.

Joseph Stelwagon Passes

The National Association of Sheet Metal Distributors sent the following bulletin to officers, members of the executive committee and advisory board on July 15, 1940:

"It is with deep sorrow that we advise you of the death of Joseph Stelwagon, President of the Stelwagon Manufacturing Company, who passed away suddenly on Saturday, July 13th. He was 54.

"Mr. Stelwagon was a devoted member of our association, serving as a member of our executive committee and as chairman of the Prepared Roofing Committee.

"He leaves an enviable reputation, as well as a host of friends in the manufacturing, distributing and contracting trades and his friendship, counsel and advice will be sadly missed.

"Mr. Stelwagon's untimely death is a great shock and with his family and business associates, we mourn our irreparable loss."

George A. Fernley, Secretary-Treasurer.

RMA and ACMA Combine

The Air Conditioning Manufacturers' Association and the Refrigerating Machine Association, the two leading trade associations in the air conditioning and refrigeration industries, have announced a combination of their activities, effective July 1. The new association is to be known as the Air Conditioning and Refrigerating Machinery Association.

Primary result of the combination, according to the Association statement, will be a broadened scope of operations, with particular attention being given to equipment standardization in the commercial refrigeration and air conditioning fields.

Officers are:

President—S. E. Lauer, York Ice Machinery Corporation, York, Pa.

1st Vice President—S. M. Crocker, General Electric Company, Bloomfield, N. J.

2nd Vice President—E. T. Murphy, Carrier Corporation, Syracuse, N. Y.

Treasurer—P. A. McKittrick, Park-Cramer Company, Fitchburg, Mass.

In addition to the officers, the following constitute the Board of Directors:

W. H. Aubrey, Frick Company, Incorporated, Waynesboro, Pennsylvania.

H. Bissell Carey, The Automatic Refrigerating Company, Hartford, Connecticut.

P. Y. Danley, Westinghouse Electric and Manufacturing Company, Springfield, Massachusetts.

J. M. Fernald, Baker Ice Machine Company, Incorporated, Omaha, Nebraska.

F. T. Goes, The Vilter Manufacturing Company, Milwaukee.

G. A. Heuser, Henry Vogt Machine Company, Louisville, Kentucky.

Lee Nusbaum, Pennsylvania Engineering Company, Philadelphia.

H. R. Sewell, B. F. Sturtevant Company, Boston.

C. W. Vollmann, Linde Canadian Refrigeration Company, Limited, Montreal, Canada.

G. E. Wallis, The Creamery Package Manufacturing Company, Chicago.

Charles E. Wilson, Worthington Pump and Machinery Corporation, Harrison, New Jersey.

William B. Henderson, who has served as Executive Vice President of both RMA and ACMA for the past six years, will be the executive officer of the Air Conditioning and Refrigerating Machinery Association, with officers in the Southern Building, Washington, D. C.

Stoker Manufacturers Committee Chairmen

Frank Hoke, president of the Stoker Manufacturers Association, and vice president of Holcomb & Hoke Manufacturing Company, Indianapolis, Indiana, announces the following appointments of chairmen of standing committee of the Association for the ensuing year:

Advertising and Public Relations—J. M. McClintock, chairman—Illinois Iron & Bolt Company, Chicago

Business Standards Committee—A. D. Scoville, Chairman

Cotta Transmission Corporation, Rockford, Illinois

Commercial Committee—B. O. Fink, Chairman—Auburn Foundry, Inc., Auburn, Indiana

Legislative Committee—R. C. Goddard, Chairman—Combustioneer Division, Steel Products Engineering Company, Springfield, Ohio

Engineering and Research Committee—E. C. Webb, Chairman—Iron Fireman Manufacturing Company, Cleveland

Ways and Means Committee—J. E. Martin, Chairman—Link-Belt Company, Chicago

Traffic Committee—C. J. Incrocci, Chairman—Link-Belt Company, Chicago

Mr. Hoke heads the Executive Committee of the Association, which is an elective position and is also ex officio member of each standing committee.

In previous years the Engineering and Research Committees were handled by separate chairmen, but this year the two committees were combined under the chairmanship of Mr. Webb, and then subcommittees on engineering and research will function to study problems of individual nature on both engineering and research.

New PRODUCTS

For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 95 and mail to us.

● Indicates product not listed in 1940 Directory.

△ Indicates manufacturer not listed in 1940 Directory.

148—Lock Opener

Atlas Machine & Tool Co., 1721 N.E. Alberta St., Portland, Oregon, announces the Atlas Pittsburgh lock-opening machine, for electrical or



manual power. The machine is light weight, portable and self-contained, with special bench standard. Adjustable vertical guides and drive rollers are set in a cast steel frame.

149—E-Z On Anvil Free

M. A. Gerett Corp., 2945 N. 30th St., Milwaukee, maker of the E-Z-On damper regulators, has developed a new damper setting anvil, which works on the rivet set principle and eliminates the use of the wood block to clinch the prongs of the regulators. The anvil is free for a limited time with the purchase of one gross of E-Z-On damper regulators—either the standard type or the new Snap-Tite.

150—Air Mover

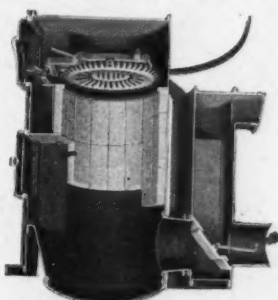
J. L. Skuttle Company, 1015 Franklin St., Detroit, announces the Skuttle Air Mover, which draws the warm



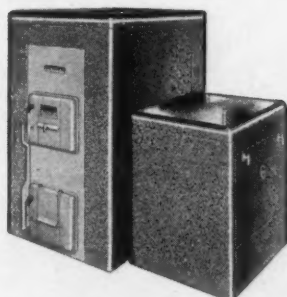
ceiling air through the register above the heater, sends it to the rooms to be heated and then draws it back again to the heating unit.

151—Dowagiac Steel Furnace

The Dowagiac Steel Furnace Company, Dowagiac, Mich., announces their new Dowagiac line of coal fired furnaces and winter air conditioners.



The Dowagiac is now riveted and welded and has an attractive new streamlined front. It is a double front without a bolt or nut showing, but with piano hinged doors and chromium trimmed handles. Radiators



have been increased in size and the direct damper is now operated outside the casing. The Dowagiac is supplied in round galvanized gravity and in forced air square cased, finished in blue Hammerloid baked enamel only. Sized up to 250,000 Btu at register on forced air installations.

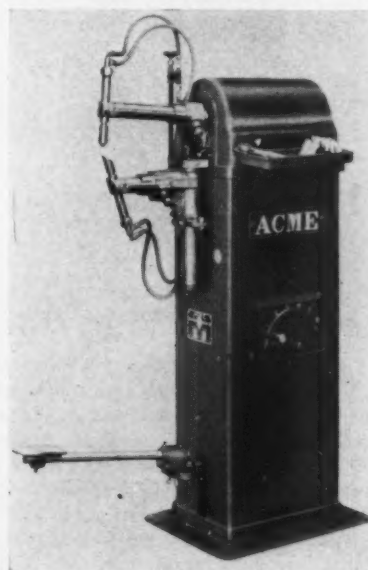
152—Gas Floor Furnace

Cole Hot Blast Mfg. Company, 3108 West 51st St., Chicago, is manufacturing a gas-fired floor furnace in three sizes—20,000, 30,000 and 40,000 Btu input—to be hung from the floor joists. A new patented gas burner with patented automatic air intake, produces a tall semi-luminous flame. A combination safety pilot and automatic thermostatic heat control is extra. The inner heating unit is full vitreous porcelain enamel inside and outside, is crimped and sealed to insure a gas-tight, stay-tight construction. Long delayed flue travel obtains maximum heat from the fuel.

153—Hot Spot Welders

Acme Electric Welder Company, 5621 Pacific Blvd., Huntington Park, California, announces a new improved line of foot operated rocker arm type spot welders with all-welded fabricated steel bases.

The Type O with stationary lower horn holder and the Type 1 with



swivel lower horn holder are manufactured in 10, 15 and 20 KVA capacities and in throat lengths 12 to 36 in., with water cooling equipment.

A clamping block device retains the horns in the horn holders with electrical contact. A half-turn of the 5/8 in. diameter set screw releases the horns for a change of set-up. Horns are universal double end reversible—one end machined to hold electrodes at 90 degree angle and opposite end 22½ degree angle.

154—Reaction Soldering

Colonial Alloys Company, E. Somers, Trenton Ave. & Martha Sts., Philadelphia, announces Reaction solder, a powder which contains a combination of selected electro-positive metals, with chemicals, to form a chemical reaction with the metals which it joins.

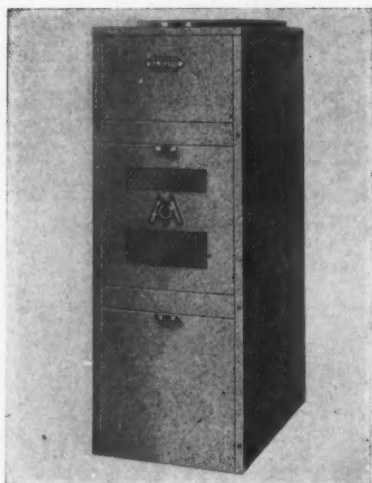
Reaction solder works with both ferrous and non-ferrous metals—iron, steel, stainless steel, copper, bronze, nickel, tin, aluminum, aluminum alloys, monel metal, brass and other metals. It also acts as a filler for breaks, cracks, etc., of the castings of these metals.

New Products

For your convenience in obtaining information regarding these items, use coupon on page 95.

155—Automatic Heating Unit

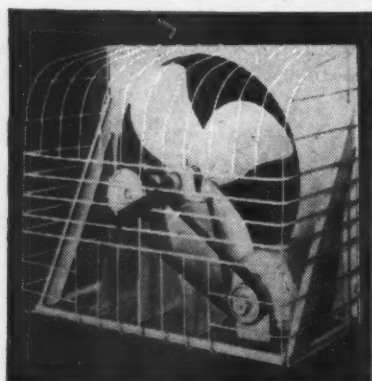
The Majestic Co., Huntington, Indiana, announces the No. 306 automatic heating unit for oil or gas, completely assembled. Installation requires only connecting the oil lines, attaching thermostat and line wires to their respective binding posts.



For oil burning, the oil burner is high pressure type. For gas burning the burner is completely automatic. The blower is in the compartment under the heating element. Heavy gauge furniture steel is used throughout the heater. Btu capacity 75,000. The unit includes furnace, casing, oil or gas burner, controls, precast combustion chamber, humidifier, blower, motor, pulleys, belt and automatic draft control. Filters are extra.

156—Wind-O-Fan Junior

Chelsea Fan & Blower Co., Inc., 370 West 15th St., New York City, announces a new cooling unit, the Chelsea Wind-O-Fan Jr., for homes,



apartments, stores, offices, etc. Adjustable spacer is furnished so that the unit will fit in a window ranging in width from 26 to 32 in. The fan is capable of delivering 3,000 cfm. Finish is ivory.

157—Model EM Oilburner

Scott-Newcomb, Inc., 1922 Pine Street, St. Louis, announces the new Model EM oil burner, designed to burn from 1 to 6 gallons per hour.



The burner has the transformer mounted on the side, with the high tension terminals projecting into the blower housing. It is provided with a new type, silent, leak-proof pump and with a new type air diffuser.

158—AC Flex-Arc Welder

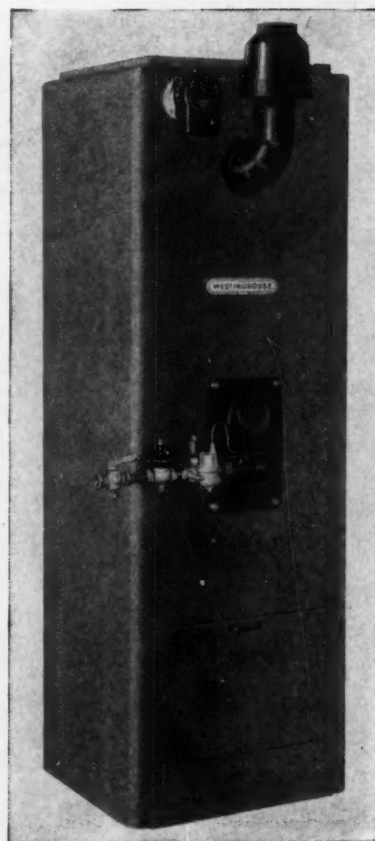
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced a new modern all-purpose portable arc welder designed for all around general utility service and production welding. Standard models operate on



either 220 or 440 volts, are completely self-contained and incorporate several distinct new design features. Current values—from 20 to 250 amperes—are indicated in large numerals.

A built-in De-Ion breaker insures protection against long sustained overloads.

The welder is self-contained, being enclosed in a rugged steel case which is mounted on three wheels, complete with all accessories including welding helmet with lens, electrode holder, all leads, and a 17-pound assortment of electrodes.



159—Winter A. C. Unit

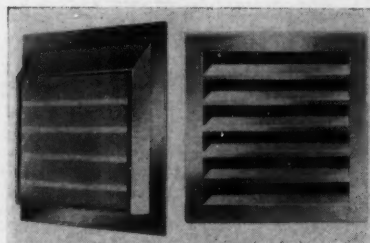
Westinghouse Electric & Mfg. Co., East Springfield, Mass., announces three compact vertical type GAV gas-fired air conditioning units, the largest of which takes 30x32 in. floor space, delivering 90,000 Btu at the register.

The units provide complete winter air conditioning with filtered warm air. The blower can be used in summer to ventilate the house.

Filters are spun glass, impregnated with an adhesive substance.

160—Vent-A-Louver

Air Control Products, Inc., Muskegon, Mich., has added to its line the Vent-A-Louver, an all steel louvered ventilator for attic and basement ventilation, available in four sizes. The ventilator is built of



heavy galvanized steel, finished in moisture-resistant aluminum paint.

A removable fly screen can be easily replaced with glass or sheet metal.

161—Pyrex Glass Float

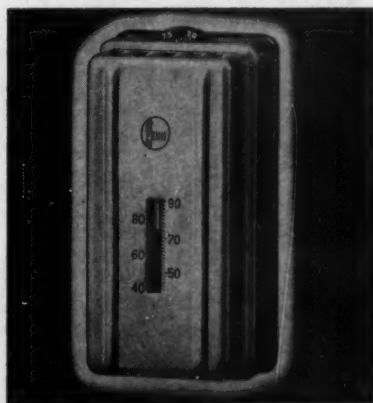
Morency-Van Buren Division, Scoville Manufacturing Company, Sturgis, Mich., announces the M-VB Pyrex Glass Float for humidifiers to meet the corrosion factor.

New Products

For your convenience in obtaining information regarding these items, use coupon on page 95.

162—Domestic Thermostat

Penn Electric Switch Co., Goshen, Indiana, is offering a new two-wire, low voltage, heat anticipating or auxiliary heat actuated thermostat for all comfort heating applications. The new construction of this 870

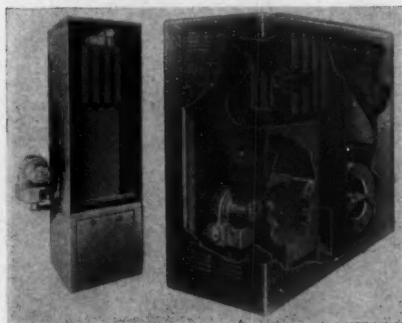


Series control replaces the company's former type 836 thermostat. The 870 series is also available for automatic Day-Nite control when used with Penn's Day-Nite Tem-Clock.

The base is moulded bakelite design for three-point mounting; terminals are set in recesses moulded into the base; a powerful, small Allnico magnet in the permanent magnet snap-acting contact is used, with a sealed calibration adjustment.

163—Oil-Fired Conditioner

Premier Furnace Company, Dowagiac, Michigan, announces the new Premier RX-4 oil-fired air conditioner, designed for utility room installation or can be used for base-

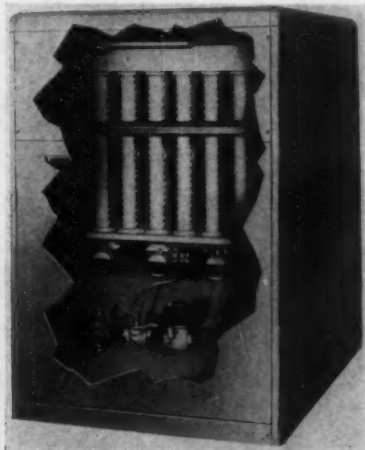


ment installation wherever basement heights are seven feet or better.

The furnace body is made of 10-ga. steel, designed especially for oil firing. Regular equipment includes a prefabricated combustion chamber lining, Minneapolis-Honeywell control system, automatic draft adjuster, oil line filter and cabinet. A duplicate model designed for basement installation is known as RX-5. These two models are additions to the RX-8 oil-fired unit.

164—Gas-Fired Gravity

Surface Combustion Corporation, 2375 Dorr St., Toledo, Ohio, has added a gas-fired gravity furnace to the Janitrol line, designed to meet the market for new small homes and to replace existing gravity units—in a complete range of sizes.



Low height, only 41½ in., is a dominant feature of the new Janitrol. Finish is neutral grey.

This gravity furnace is equipped with Amplifier burner and Multi-Thermex cast iron heat exchanger tubes, exclusive Janitrol features. A Thermal type humidifier and horizontal air flow are other advantages. The unit is fully automatic. Controls are fully enclosed, yet accessible.

165—Mirror-Lite Thermostat

Gleason-Avery, Inc., Auburn, N. Y., announces the Mirror-Lite thermostat, representing the application of transparent plastic to the thermostat field. This mirror effect creates a



soft tone that blends well with any decorative scheme. The thermostat has a single temperature scale with finger tip adjustment.



166—Oil-Fired Conditioners

Conco Corporation, Mendota, Illinois, announces major changes in their oil-fired line, in design and materials.

The horizontal combustion chamber has been changed from rectangular to circular design. This chamber is constructed of 10-ga. steel. The vertical chamber is of 12-ga. steel with 14-ga. radiators. Flat surfaces are embossed to prevent noises which follow expansion and contraction. The horizontal combustion chamber is lined with refractory material, and an alloy iron guard is installed to protect the connection between the horizontal and vertical chambers.

The new firing assembly is of turbine-like construction which draws air in a swirling motion which culminates in a tornadic whirlpool of flame in the combustion chamber.

The cabinet is heavier, 20-ga. steel, and the top is of new design for more accurate, rigid fit. Cabinet is finished in Green Hammerloid.

All internal wiring is completed, allowing for but two central connections by the electrician at the time of installation.

167—Floating Draft Control

Bailey Floating Draft Control Co., 66 Penn St., Quincy, Mass., announces a floating draft control to perform automatically without steam, water or electrical power. The control is installed in the smoke pipe at any angle, and is operated by the gases leaving the furnace.

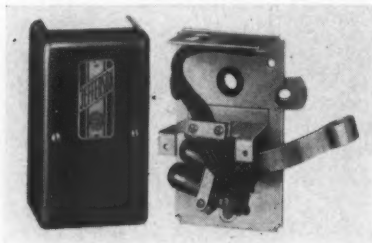
The clearance around the control is just sufficient to allow the control to clear the walls of the breeching or uptake.

New Products

For your convenience in obtaining information regarding these items, use coupon on page 95.

168—Universal Control Switch

Jefferson Electric Company, Bellwood, Illinois, has added to its line of pressure and flat switches an all-around control switch in which circuit is made and broken inside ferro-tube mercury contacts. These switches can

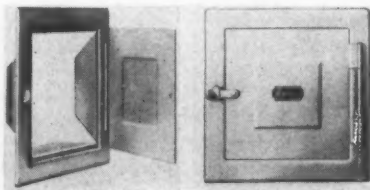


be operated by hand, by foot treadle, float or pressure in connection with signals, relays, etc.

The control can be furnished with one mercury contact for single pole make and break, or for controlling two separate circuits.

169—Cleanout Door

Majestic Company, Huntington, Indiana, announces a new low-cost Cleanout door, known as Model No. 80. Frame size is 10½x10½ in. with a door 8x8 in. The door and frame

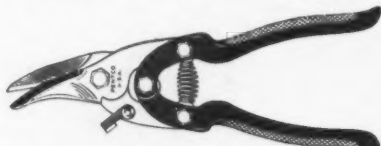


is made of 14 gauge $\frac{5}{8}$ in. steel with the frame die-pressed to provide extra strength and a close-fitting door. It has a positive locking latch and sturdy coil type hinges.

The frame is 2 in. deep and has a mortar lock. Finish is a black rust-resisting paint.

170—Aviation Snips

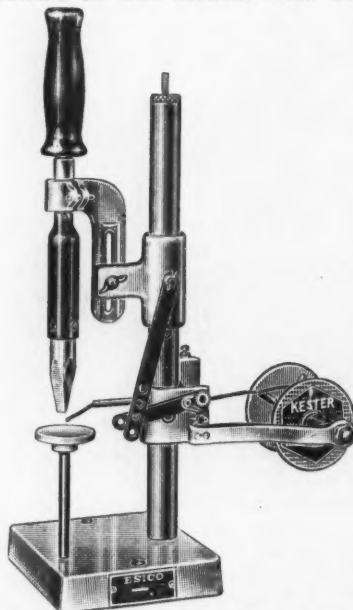
The Penn Tool Company, 2415 N. Howard St., Philadelphia, announces the Penco 95a compound action aviation snip for steel up to 16 gauge,



BX cable, BX heavy flexible tubing and wire up to 16 gauge. The blades are beveled and made from chrome vanadium alloy molybdenum steel, with serrated cutting edge. The handles are cold rolled steel, gun metal finish, and knurled to give a sturdier hold. Right and left hand styles.

171—Spot Soldering Machine

Electric Soldering Iron Co., Inc., Deep River, Conn., announces the Esico soldering machine—a treadle operated machine which advances the iron straight downward. Solder is fed forward as iron returns from work.



Solder up to $\frac{1}{8}$ in. diameter may be used, and feeding may be regulated by adjustment of pawl lever which actuates feeding gears.

172—Oil Fired Conditioner

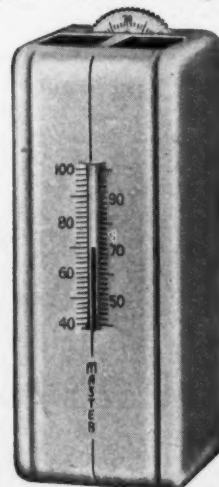
Richardson and Boynton Company, 274 Madison Avenue, New York City, announces a new oil-fired winter air conditioner built of Armco Ingot iron with grey hammerloid finish, 20-ga. steel, all-enclosed cabinet.



The unit has a built-in high temperature stainless steel refractory firebox so designed that any pressure atomizing burner of standard manufacture can be used with it. The burner compartment is 18 in. in depth. Equipment includes float operated humidifier and standard type furnace-stat. Btu output is 100,000.

173—Master Thermostat

The White Manufacturing Company, 2362 University Avenue, St. Paul, announces a new Master thermostat—Type A-23—with molded bakelite base and ventilated, drawn-metal case. Polarized snap-action is



employed, which, together with a sensitive bi-metal blade guarantees a minimum temperature differential.

Capable of being adjusted for a differential as low as .3 of a degree, the commercial instruments are set for .5 of a degree. A transparent shield covers the contacts and protects them from dust results.

The thermostat is designed with a range of 55 to 95 degrees. It can be furnished with a range as low as 35 to 75 degrees.

Standard finish is white gold. Ivory and other finishes are also available. Wall mounting plate is furnished.

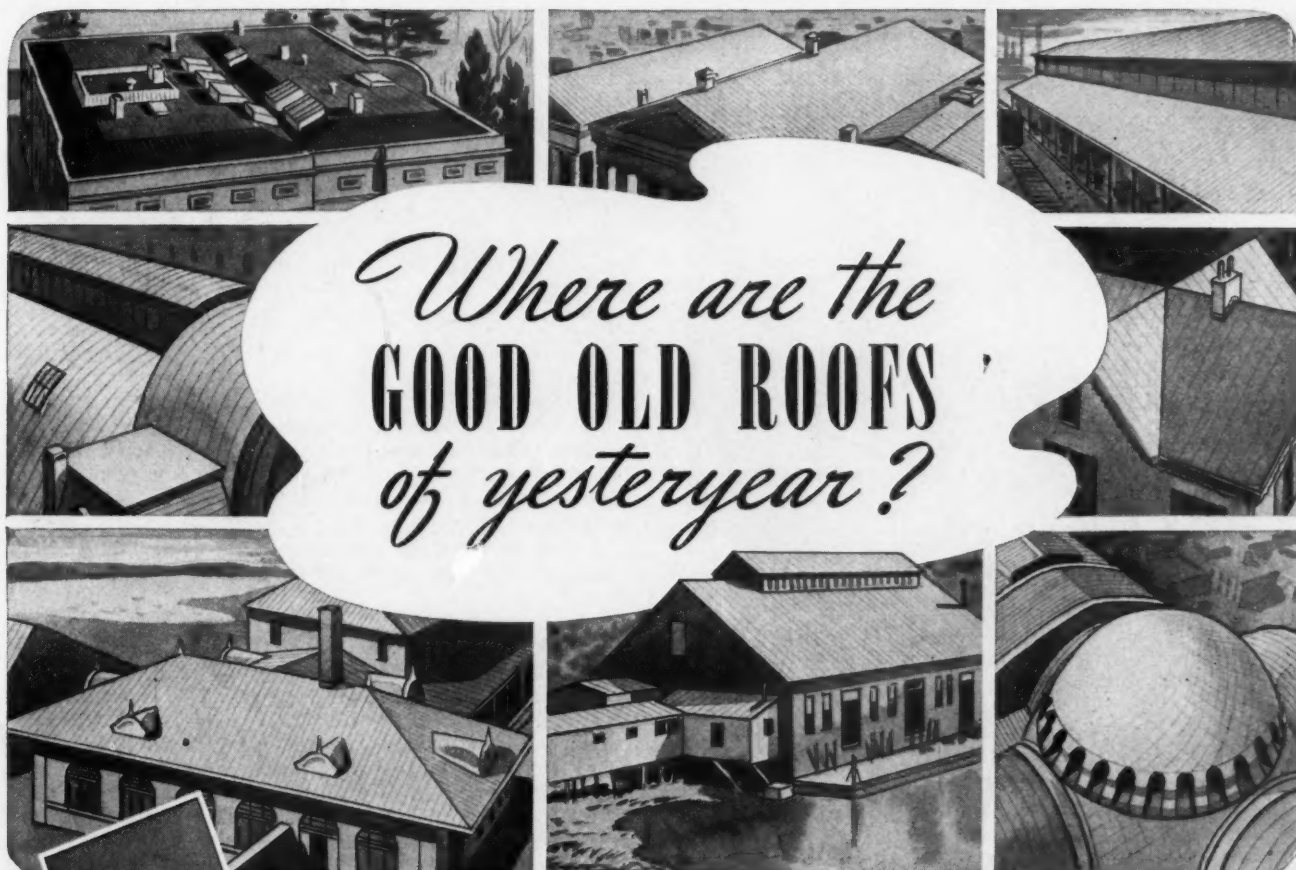
174—Industrial Insertion Humidistat

Julien P. Friez & Sons, 4 N. Central Avenue, Baltimore, announces a new insertion humidity control, suit-



able for use where dust and dirt prevail.

The new control features the Friez multiple human hair element, and a switch mechanism fully enclosed in a molded plastic case. Control of both humidifying and dehumidifying are provided over a range of from 10 to 100 per cent R. H., with a sensitivity of plus or minus 1 per cent.



8 lb.

SAXON

15 lb.

AVALON

20 lb.
25 lb.
30 lb.
40 lb.

OLD METHOD

40 lb

TAYLOR
EXTRA COATED

Special

TARGET
AND
ARROW



● Every roofer knows of old roofs made with good terne plate which, after forty or fifty or more years of service, are still thoroughly weather-proof. And he yearns for the good old material of years gone by.

Yet he can buy it today—the famous Taylor Ternes made now by Republic Steel Corporation with the same artisanship employed during the nineteenth century by that well-known caterer to the roofing trade—N. & G. Taylor Co.

Yes, sir—with Taylor Ternes, obtainable from your local jobber, and a bucket of good linseed oil paint, you can build a roof that would have delighted the shrewd builder of a century ago, and that will be a truly equally economical one to your present customers.

Made in five grades and in several weights of coating. Write for detailed literature to Republic Steel Corporation, General Offices, Cleveland, Ohio.

BERGER MANUFACTURING DIVISION • NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION • UNION DRAWN STEEL DIVISION
TRUSCON STEEL COMPANY



Republic

TAYLOR ROOFING TERNES



CAST IRON FURNACES



STEEL FURNACES



WINTER AIR CONDITIONERS



OIL BURNERS



BLOWERS



STOKERS



HUMIDIFIERS



Model RX-8—Completely automatic oil air conditioner of new design. Moderate in price and amazingly economical to operate.



PREMIER Dealers Set For Great Sales Campaign on Complete Home Comfort Line

PREMIER Dealers are ready for a big Autumn. They have the most complete . . . most salable PREMIER Line ever developed. They are backed with an amazing program of factory help in merchandising and engineering. And—they are confident that they are going to make money—more money than ever before.

You, too, can make this selling season your biggest and best—with PREMIER. Mail the coupon—get acquainted with this complete line—this thorough-going dealer cooperation. ACT NOW to increase your present profits and safeguard your future with the exclusive PREMIER franchise.

PREMIER FURNACE CO.
DOWAGIAC, MICHIGAN

MAIL COUPON TODAY

PREMIER FURNACE CO.
Dowagiac, Mich.

Send me the profit story of today's most complete line and today's greatest dealer help program.

Firm Name.....
By.....
Street No.....
City..... State.....

Find Out How You, Too, Can Cash in On This Big Drive for Sales and Profits

New Literature

For your convenience in obtaining copies of new Literature use the coupon on page 95

204—New and Rebuilt Machines

Interstate Machinery Co., Inc., 1431 W. Pershing Road, Chicago—liquidators and appraisers—is distributing Catalog No. 104, with descriptions of new, used and rebuilt machinery for metal fabricating, sheet metal, production machinery and machine tools. The book is indexed, has 200 illustrations.

205—Fan Performance Tables

The New York Blower Company, 32nd Street and Shields Avenue, Chicago, has published new Capacity Tables (1940 Editions) for Type ME centrifugal fans—both slow speed and high speed wheels. The tables are in the company's conventional 8½x11 sectional catalog form. The slow speed tables and engineering notes comprise 16 pages and the high speed tables 24 pages.

206—Quick Method Estimating Chart

The Char-Gale Manufacturing Company, 3125 Hiawatha Ave., Minneapolis, has ready their new No. 40 Catalog of 96 pages. It contains the Char-Gale "Quick-Method" estimating chart, which engineers jobs for all types of air conditioning systems with pre-fabricated ducts and fittings to match. It also shows and describes the new Char-Gale Replacement Casings, which are made-to-order to modernize any size or model of warm air heating plant.

207—Cooler Fan Catalog

The Emerson Electric Manufacturing Company, 1843 Washington Ave., St. Louis, is distributing a 12-page catalog entitled "Cooler Fans for Home and Business" covering a complete line of belt-driven Home Cooler fans for attic installation, window installation. A special section is devoted to the use of these belt-driven fans in commercial and industrial applications.

Fans, plenum chambers, ceiling and outside shutters are all illustrated and described. Specifications, performance and prices are included.

208—Furnace Pipe and Fittings

Milcor Steel Company, 4100 West Burnham St., Milwaukee, offers Catalog No. 35-B.

The Milcor catalog gives prices and trade data on Milcor LockJoint and Titelock furnace pipe and fittings, elbows, angles, and accessories, furnace bonnets, registers and cold air faces, rectangular pipes and fittings for forced air systems, humidifiers, stove pipe, Airtite heaters, and bake ovens.

A particularly helpful feature of the catalog is a section devoted to diagrams of typical installation problems, illustrating their solutions and the method of computing costs.

209—Stainless Steel Properties—Chart 381

Republic Steel Corporation, Cleveland, has just released a handy four-page, letterhead size folder which contains a table listing the analyses and properties of thirteen of the most popular types of Enduro stainless steel. For comparison purposes, identical data for a carbon steel, S.A.E. 1020, are listed.

The chart includes the American Iron & Steel Institute type numbers, approximate chemical compositions, physical properties, electrical properties and mechanical properties. In addition, heat-treatment is indicated, heat-resistance is shown and fabricating properties, including welding, machining and drawing or stamping, are described.

New Literature

For your convenience in obtaining copies of new Literature use the coupon on this page.

210—Complete Rybolt Line

The Rybolt Heater Company, Ashland, Ohio, is distributing an envelope stuffer listing their complete line of warm air furnaces and winter air conditioners—steel and cast iron—fired by coal, gas and oil.

211—Oilfire Monogram Automatic Furnace

The Quincy Stove Manufacturing Company, Quincy, Illinois, is distributing Catalog No. 40-1 covering their new Oilfire Monogram automatic furnaces, featuring the Monogram patented gravity vaporizing oil burner.

212—Automatic Humidifiers

Maid-O'-Mist, Inc., 215 N. Aberdeen St., Chicago, is distributing a catalog sheet No. 701, dated June 15, and illustrating and describing their various types of automatic humidifiers, water line control valves and water softeners.

213—Grinding and Polishing Machine

Jefferson Machine Tool Co., Fourth, Cutter and Sweeney Sts., Cincinnati, Ohio, is distributing a four-page folder illustrating and describing their No. 101 Spring Frame grinding and polishing machine for wheels up to 14 in. diameter, for grinding or polishing sheets, tubing, bars, shapes, etc., too large for the usual standard floor lathes. Specifications are included.

214—Wall Blueprint

The Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago, is distributing a wall blueprint showing Ex-

celsior forced air ducts and fittings with a brief description, sizes and prices—ducts, connections, elbows, angles, collars, outlets, stackheads, side rails, round branch outlets, dampers and end caps, corner and slip connection, and stack boots.

215—Facts to Make More Money

Airtemp Division, Chrysler Corporation, Dayton, Ohio, is distributing a 24-page spirally bound book, 11x14, entitled "Facts Prove Easy Way to Make More Money with Chrysler's Airtemp in 1940," covering their oil burners, oil-fired winter air conditioner, gas-fired conditioners with the "Silent Flame" gas burner, the cast iron gravity furnace, winter air conditioner for either coal or oil, steel gravity furnace, and the Summer air conditioning units.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave., Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

148	149	150	151	152	153	154
155	156	157	158	159	160	161
162	163	164	165	166	167	168
169	170	171	172	173	174	
204	205	206	207	208	209	210
211	212	213	214	215		

Name..... Title.....

Company.....

Address.....

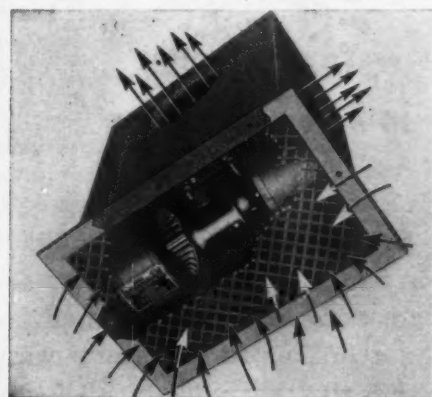
Are you Manufacturer——Jobber——Dealer——

YOU don't have to sell SPACE HEATERS to CASH IN on this \$25,000,000 market - - - because every home using a space heater is a prospect if you sell the Skuttle Air Mover

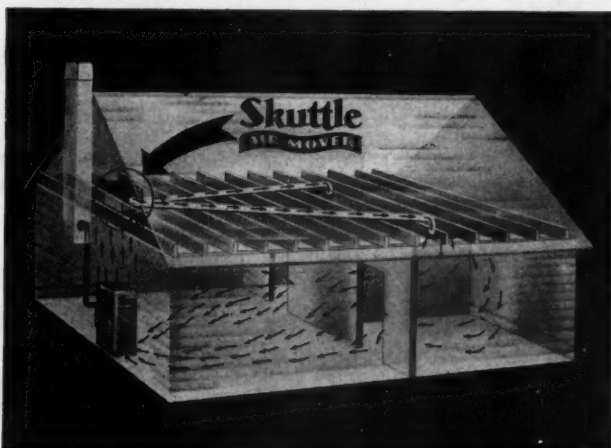
Whether it's a wood, coal, gas or oil space heater used in the home, the SKUTTLE AIR MOVER will increase its heating efficiency. This blower unit will circulate heat in 2 to 3 extra rooms, as desired. It comes completely assembled with rubber mounted blower motor switch and register. It is simple to install, any home owner can do the work himself.

Order a SKUTTLE AIR MOVER today if you want to cash in on this tremendous space heater accessory market.

Skuttle
AIR MOVER



● The cut-away illustration above shows how the heated air is drawn through the register of the SKUTTLE AIR MOVER and pushed out the duct openings.



IT Circulates HEAT IN THE WINTER and Cool AIR in the SUMMER

An added advantage of the SKUTTLE AIR MOVER is that it can be used to cool off the house in the summer by merely removing the top of the unit so that the hot air can be drawn out of the rooms and blown through an attic window.

The illustration at left shows how the unit is placed between the joists in the attic, directly above the heater with insulated ducts leading to the rooms to be heated. The blower draws up the heated air through the register and pushes it out through the duct openings, thus circulating the heat evenly in each room.

The SKUTTLE AIR MOVER is a fast-selling accessory for space heaters, that can increase your profits both in the winter and summer months. Their low prices should interest you, so why not write for complete details and prices today?

J. L. SKUTTLE CO.
AIR CONDITIONING EQUIPMENT

1015 FRANKLIN ST.

DETROIT, MICH.

MONCRIEF FURNACES

and
Winter Air Conditioners



It's a great thing to be able to tell any prospect "I have a Moncrief that just fills the bill for you—in fact, it was specially designed for situations such as yours." That is the advantage of handling a line of furnaces and winter air conditioners that is *complete*. All are up-to-the-minute in style and finish, scientifically engineered, and include every feature that produces finer winter comfort.

For modern design and styling, high efficiency and low operating cost you can rely on Moncrief.

Send for illustrated descriptive literature.

The HENRY FURNACE & FOUNDRY CO.
3473 East 49th Street, Cleveland, Ohio

MONCRIEF Supplies EVERYTHING used on a WARM AIR FURNACE or an AIR CONDITIONING INSTALLATION

With the Manufacturers . . .

Lamneck in Middletown

Lamneck Products, Inc., formerly of Columbus, Ohio, now occupies their new general offices at Middletown, Ohio. Telephone 2921.

George Harms Breaks Hip

George Harms of F. Meyer & Bro. Co., Peoria, Illinois, fell among the ruins of the old plant (burned on May 27) and broke his hip on July 8. He is still at the hospital and will be for a while, but is up on crutches a little each day. Mr. Harms is 81 years of age.

Window Billboard

Montag Furnace Co., Portland, Oregon, is located near the intersection of two heavily traveled bridges with approximately 46,300 automobiles passing every 18 hours, and had no way to reach them inexpensively.

Richard N. Ferris for MacWilkins & Cole, Inc., the



firm's advertising agency, designed the window-billboard shown. It is 8 feet high and 12 feet wide, depicting the firm's sales message to the public.

The window display, 12 feet wide and 3 feet deep, is built around the sales message giving the merchandise and its qualities an opportunity to present themselves in detail to the sidewalk traffic.

Obituary

Weiss of Research Products Dies

Research Products Corporation, Madison, Wisconsin, announces with deepest sorrow the death of their president, Howard F. Weiss, on Sunday, July 7.

Harold B. McFarland Dies

The Carter, Donlevy Co., jobbers, 1419 Spring Garden Street, Philadelphia, announce with sincere regret the death of their president, Harold B. McFarland on Monday, July 15, 1940.

Donald M. Smith Dies

Donald M. Smith, Assistant District Sales Manager, in the Chicago Office of Allegheny Ludlum Steel Corporation, died at his residence, West 121st Street and South 90th Avenue, Palos Park (Chicago), on June 21, 1940. He is the husband of Louise Smith, father of Donald and Dunn Smith. Prior to the merger with Ludlum, Mr. Smith was District Sales Manager for the Allegheny Steel Company.

You Offer All These Advantages with CURTIS PACKAGED Air Conditioners

The complete Curtis line of Packaged Air Conditioning Units includes 5 sizes from 3 to 15 tons capacity. With this line you can meet the requirements of practically every class of retail establishment; offices, stores,

restaurants, institutions, etc.

In addition, Curtis Packaged Units offer you and your customers *all* these important advantages — all sound, attractive sales points that mean increased sales and profits for you:

- Low first cost — low operating expense
- Easily installed in one day
- Easily moved if desired
- Units cool, dehumidify, circulate and filter the air
- Attractive exterior appearance
- Adaptable for heating purposes
- Readily financed
- Correctly balanced — precision engineered, assembled and tested at the Curtis factory

Curtis provides an opportunity for you to get your share of profits from the vast packaged air conditioning market that is widening day by day. A letter will bring you complete information on the complete Curtis line.



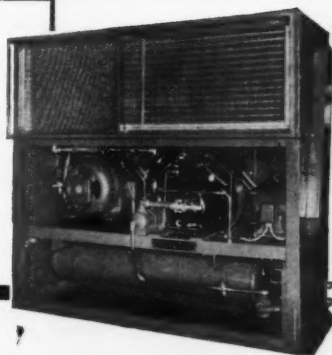
Established 1854

CURTIS REFRIGERATING MACHINE CO.

Division of Curtis Manufacturing Co.

1946 Kienlen Ave.

St. Louis, Missouri

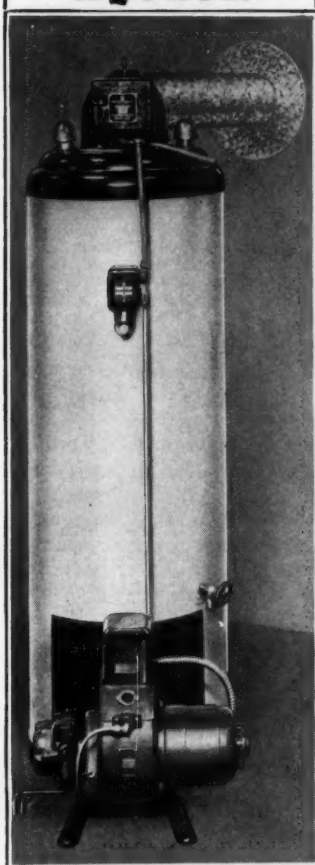


Above: 7½, 10, 15 ton Remote or Central Type Air Conditioner.

Below: 3 and 5 ton Packaged Type Air Conditioner.



AQULUX



The New Johnson Aqulux "85" equipped with "Bankheat" BH-O Oil Burner.

The Johnson Family

SINCE 1904 the name of JOHNSON on an oil burner has been accepted as the seal of fine engineering, skilled craftsmanship and dependability. JOHNSON equipment on an architect's specifications insures satisfaction and comfort for the home owner with economical operation over the years.

AQULUX "85", the new oil burning water heating unit, powered by the famous Johnson "Bankheat" burner, is the ideal installation for small homes. Large homes, clubs, apartments and commercial houses find **AQULUX "150"** specially designed for their needs.

SELECTAIR combines in one compact unit every feature desired for economical heating, air-conditioning and ventilating the modern home.

LADDI "DU-ALL" is a combination boiler-burner unit for small and medium-sized homes. Automatic, odorless, quiet, trouble-free.

AEROLUX is the new streamlined direct-fired air-conditioner for automatic and economical home heating and ventilating.

Heavy-duty installations:

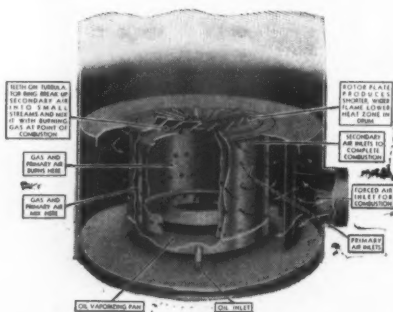
Manufacturers, hotels and industrial enterprises have found JOHNSON heavy-duty installations efficient and economical. Special bulletins and specifications covering all types of oil burners available. We will be glad to assist in preparation of layouts and estimates.

Worthwhile territories and franchises available to aggressive dealers anxious to serve their communities with a complete line. Write today, giving details on qualifications.



S.T. JOHNSON CO. 940 ARLINGTON, OAKLAND, CALIFORNIA
401 N. BROAD ST., PHILADELPHIA, PA.

INVESTIGATE the new **MONOGRAM** VAPORIZING OIL BURNER



Burns with
a Clean,
Quiet
GAS FLAME
Made from
OIL . . .

THERE'S a lot of money to be made in the Warm-air Conditioning field and you can get your share of it by specifying and installing the MONOGRAM automatic furnace. This revolutionary heating plant has the patented Monogram vaporizing burner as its heating element, assuring the dealer and customer many seasons of clean, trouble-free, fully automatic heat.

The Monogram burner illustrated above vaporizes the oil quicker and more completely. These oil vapors are mixed with just the right balance of both Primary and Secondary air, producing a clean, quiet gas flame made from oil. Burner has no moving parts. Over 80% operating efficiency.

MONOGRAM Automatic Oil furnaces are made in any size you need with a special model for low cost FHA housing jobs without basements. Also included in the line are a booster gravity unit in two sizes for replacing present hand-fired warm-air furnaces quickly and easily, and a full



Model 101. Automatic forced Warm Air Unit for Small FHA Homes.

forced winter air conditioning unit in two sizes. There is also a specially designed model for the large filling station field.

The heating season will be here shortly and it's up to you to start now if you want to get some of that extra profit. Write us today for catalog showing the complete line.



Model 150 Winter Air Conditioner.

**Write NOW
for further
information.**

THE QUINCY STOVE MFG. COMPANY
General Offices and Factories
QUINCY, ILLINOIS

With The Manufacturers . . .

D. W. Russell Named Airtemp President

K. T. Keller, president of Chrysler Corporation, announces that D. W. Russell has been selected president of Airtemp, the company's air conditioning and heating division in Dayton, O., to take over the duties of Col. A. C. Downey, on extended leave of absence.

Schneider Heads Milcor Division

Milcor Steel Company, manufacturers of sheet metal and fireproof building products, announces the appointment of George Schneider to the managership of its newly reorganized heating and ventilating division.

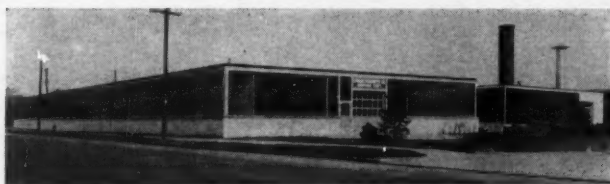
Twenty years' experience with Milcor has given Mr. Schneider a thorough knowledge of the sheet metal and heating industries and their problems. He spent his first six years with Milcor in the shipping and order departments and then became a Milcor salesman. For the past 13 years Schneider has covered Wisconsin's Fox river valley and upper Michigan territories for Milcor.



A. F. Davis Becomes "Chief Fleetweld"

At the International Petroleum Exposition at Tulsa, Oklahoma, A. F. Davis, vice-president and secretary of The Lincoln Electric Company, Cleveland, was presented with a tomahawk and a headgear of the Osage Indian tribe, thereby being inducted into the Fusion Welding Forum as fitting honor for his long service to the welding industry.

It was requested that Mr. Davis use the title "Chief Fleetweld" on his contributions to the Lincoln "Stabilizer," a welding paper published by Lincoln Electric.



Evans Products Company, Detroit, manufacturers of Evanair and Evanair space heaters, announces completion of this new addition to its plant, necessitated by expansion of Evanair and Evanair heater production. Evans' entire Detroit plant has been rearranged to incorporate this addition into the manufacturing program.

Lau Blower Film

The Lau Blower Company, 2001 Home Avenue, Dayton, Ohio, has just completed a two-reel industrial movie film. Kodachrome film was used to portray in true-to-life colors the various operations that enter into the planning, development, and production of Lau blowers, blower wheels and blower housings.

The film is to be shown principally to the managerial and engineering departments of manufacturing companies interested in the purchase of blowers and blower parts for use with equipment of their own fabrication.

The film shows the development of The Lau Blower Company, starting with the first plant. Successive steps in Lau's development is chronicled down to the present plant with its 65,000 sq. ft. of plant space, on one floor.

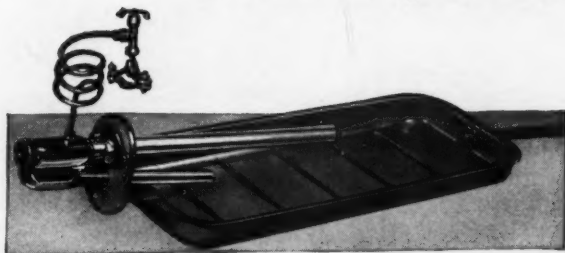
A Lau representative reads from a script while the movie is being shown. The main section of the film conducts the spectator through the plant in logical sequence.

The multiple management plan of management was inaugurated last year. Three boards—the Executive Board, the Senior Board, and the Junior Board—enable Lau employees as well as the management to participate in the planning and direction of the company.



DRIP ... DRIP ... DRIP ... *Directly on a Hot Pan Surface!*

Give Your Customers This More Effective, More Dependable Method of Water Evaporation



*Another Extra that Tells You
THERMO-DRIP
is the best
buy*



A thin layer of water in a pan heats and vaporizes faster than a brimful pan of water. The drip feed keeps only a sheath of water in Thermo-Drip's light gauge, uncoated, stainless steel pan.

An automatic humidifier is no longer a tricky thing to sell. Not when you handle the THERMO-DRIP Humidifier. Its drip feed—*automatically* stepped up or throttled or shut off, depending upon furnace bonnet temperatures—is a principle householders understand and recognize as a sensible, more practical, more scientific method of water evaporation. It isn't necessary for you to think up "fancy comebacks" when you offer this amazing humidifier. Cash in on it. Push THERMO-DRIP! Send for complete details.

AUTOMATIC HUMIDIFIER CO.

18th and Main Streets

CEDAR FALLS, IOWA

THERMO-DRIP

Automatic HUMIDIFIER

NOW... A Safe-Return Damper Motor with **STILL GREATER SAFETY**

The New G-A

with Positive *straight-line* control
that prevents chains from tangling.



NOW sell this new safety feature—meet the demand of your large market of hand fired heating plants with this new low-priced G-A Control Motor. Designed for greater safety . . . faster selling . . . larger margin of profits!

This new improved G-A Damper Motor features positive *straight-line* control—a rack slides back and forth through the case. No sprockets, no rotating arms. This straight-line principle—exclusive G-A—protects your customers against the common fault of tangling chains—eliminates unnecessary service calls. Assures safety at all times. If current fails, spring return closes drafts *instantly*—prevents danger of uncontrolled fires.

New two wire control circuit makes easier wiring. Terminals *outside* of case. Motor coils and leads enamel glass insulated—eliminates motor troubles. No insulation failures. May be mounted in any position. Rustproof, dustproof.

Write for Your Folder TODAY!

Just send us a postcard now for descriptive folder—detailed information about this new Damper Motor as well as the complete G-A line will be mailed to you immediately.

District Representatives

The H. M. Flemming Co.,
Inc.
30 Church Street
New York City

Mr. Floyd T. Whitney
5738 12th Street
Detroit, Michigan

General-Associated Oil
Burner Co.
1214 Springgarden Street
Philadelphia, Pa.

Smith & Dale
457 Stuart Street
Boston, Massachusetts

Mr. Fred W. Forward
520 West Boulevard
Elkhart, Indiana

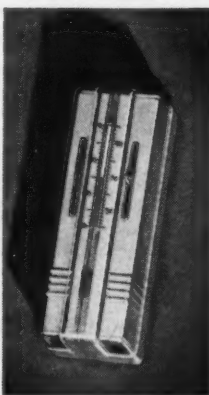
R. W. Anderson & Co.
67 Carlton Street
Toronto, Ontario

GLEASON-AVERY, Inc., 18 Clark Street, Auburn, N. Y.

The New G-A MIRROR-LITE Thermostat

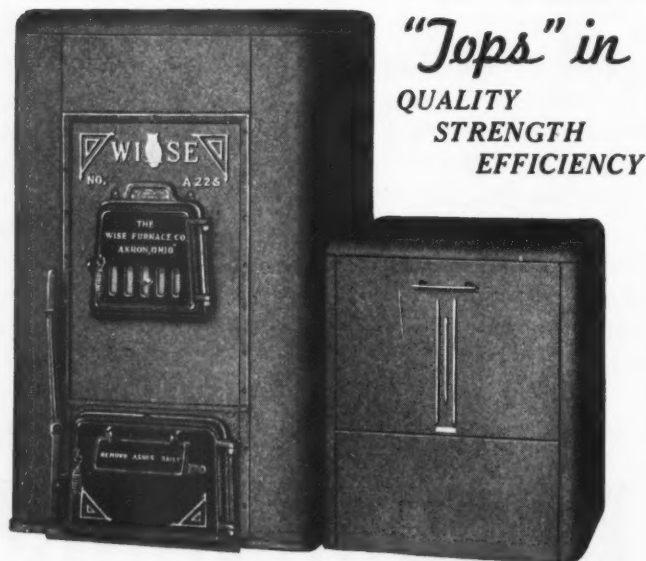
**New Beauty . . .
New Styling**

Already winning popular response with dealers and customers everywhere . . . gives quicker, easier readability. **MIRROR-LITE's** soft finish blends well with any room decoration. Styled for greater eye-appeal . . . low priced for faster selling . . . plus greater profit margin! Write today for descriptive folder.



WISE SERIES "A"

THE *Right* UNIT FOR GRAVITY OR AIR CONDITIONING JOBS



One of the big reasons behind the success of the WISE Furnace line is the ability to supply exactly the right unit for every installation. Many times a job will depend on whether or not the contractor can supply just the right furnace or air conditioning unit, and if he can't the job generally goes to someone else.

Contractors handling the WISE Line seldom have to cope with such a situation. They know they can secure a performance-proved unit for any installation and can bank on it to perform season after season with little or no attention.

The Wise Series "A" Furnace can be used on gravity jobs or can be supplied with a square base for air conditioning use. It assures contractors of service-free installations and home-owners of efficient, economical operation for many, many years.

There's plenty of literature and sales assistance waiting for you . . . just drop us a postcard!



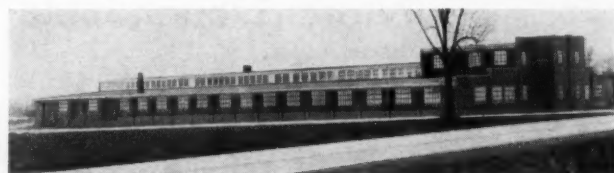
WISE FURNACE COMPANY

AKRON, OHIO

With the Manufacturers . . .

Aldrich Holds Open House

Aldrich Company, Wyoming, Illinois, held open house on Friday, July 19—8 to 10 p.m.—with the entire plant in operation. L. I. Aldrich and W. A. Hale extended a cordial welcome to Wyoming citizens and a guide service



was furnished. The High School band put on a special concert at the plant entrance. Refreshments were served.

An informal program of short talks helped to make the visitors feel welcome.

New developments for 1940 include their "New Departure" burner with the new features—"Volumeter" and "Magic Dial"; the new "Sav-Haf" for No. 5 oil with engineering improvements over the 1939 model; and their new oil-fired domestic hot water heaters and heating units.

Regional Dealer Meetings

The Waterman-Waterbury Company, 1121 Jackson St., North East, Minneapolis, has just completed a series of regional dealer meetings, the last of which was held at the Curtis Hotel, Minneapolis, on June 20 and 21.



The picture shows those attending the dealers' banquet on the final day of the meeting. The banquet was conducted by dealers and salesmen, seated at the head table.

Professor S. Konzo of the University of Illinois was the principal speaker at the previous day's meeting and also at the banquet.

Winkler Conducts Sales Meetings

Herman E. Winkler, executive vice president and W. T. Winter, vice president in charge of sales supervision, U. S. Machine Corporation, Lebanon, Indiana, are conducting a series of sales meetings throughout the United States. These meetings are being held to acquaint Winkler distributors with new sales materials and the profit possibilities with Winkler stokers. The meetings are being held from coast to coast and border to border.

The company found it necessary to completely equip a second factory this spring for the production of Winkler stokers. In Plant No. 1, the company does all sheet metal work. In Plant No. 2, they do all of the machine work, painting and final assembly. Plant No. 2 has twice as much floor space as the original Plant No. 1.

In sales meetings, being conducted by factory executives, the company is showing and explaining to distributors some outstanding merchandising and sales plans.

With the Manufacturers . . .

Lorenz Harvey-Whipple Factory Superintendent

George H. Bork, vice-president and chief engineer of Harvey-Whipple, Incorporated, Springfield, Mass., announces the appointment of Harry W. Lorenz as factory superintendent, to occupy the position formerly held by Frank A. Moran, who passed away on April 10.

Collins Heads Quiet May Sales

May Oil Burner Corporation of Baltimore, Maryland, announces the appointment of Charles R. Collins as sales manager. He will be in direct charge of sales for all Quiet May oil heating equipment. He replaces Edward P. Hayes, whose resignation the company regrets to announce.

Interstate Moves General Offices

Interstate Machinery Co., Inc., Chicago, will move their general offices on or about August 15 to their large warehouse at 1431 West Pershing Road. The telephone number will be Yards 5800. This move is being made after



a careful survey which shows that in combining their office and warehouse, more adequate facilities will be available to handle inquiries and orders quickly and expertly.

The downtown branch at 107 South Clinton St. will be maintained. (Only a 15 minute run to warehouse. Free transportation provided.)

Liberty Foundry Remodels Plant

The Liberty Foundry Co., St. Louis, manufacturers of Front Rank and Mellow warm air furnaces and the complete line of Front Rank heating equipment, has completed a remodeling job on the furnace division at 2800 Ohio Street, St. Louis, at a cost of approximately \$20,000.

The buildings contain 85,000 square feet of floor space. William T. Mellow is vice president of the company.

York Increases Sales Staff

A. J. Seiler, president of the York Oil Burner Co., Inc., York, Pa., announces the appointment of three new divisional sales managers for York-Heat. Joseph H. Clark has been appointed divisional sales manager in the metropolitan New York area; Rudolph C. Stolle has been placed in charge of the upper New York territory, and R. R. Kiefer takes over the southeastern seaboard.

Alex L. Frank has been promoted to take over the management of the wholesale division.

IT'S A *Smart Move* TO INSULATE DUCTS WITH **DUX-SULATION**

Saves 75% of
the Heat Loss.
K .27 B.T.U.

High Sound Ab-
sorption. 70% in
less than 10 lin-
eal feet.

Balances job
Saves Fuel
Quiets Noises.

Fire-Safe with
Asbestos Pro-
tection built in.

Made especially
for Air Condi-
tioning, Ventilat-
ing and Warm
Air Industries.

Prevents Con-
densation, Duct
Sweating, and
Duct Rust.

Inexpensive to
use. No material
waste. Built to
last and stand
hard usage.

Moisture proof
Surface. Mildew
proof Treated.
No rotting or
chipping.

Convenient to
handle in stock
or on job. Roll
contains 100
square feet.

Standard 1/2"
thickness is right
thickness for
most jobs.

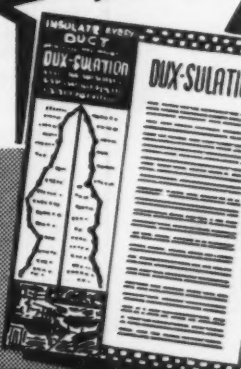
Easiest insula-
tion to apply
and looks best.

Low frictiona
resistance
Smooth surface

Can be applied
on inside or out-
side of round or
rectangular
ducts.

Comes Com-
plete, ready to
apply. No extras
to buy.

Free
BULLETIN
No. 402



YOUR COPY OF THIS VALUABLE
BOOK ON CORRECT DUCT IN-
SULATION IS READY.

WRITE FOR IT TODAY!

GRANT WILSON INC

4101 TAYLOR STREET

CHICAGO, ILLINOIS

News Items

Simplified Practice Recommendation R29-39

Printed copies of the first revision of Simplified Practice Recommendation R29, Eaves Trough, Conductor Pipe, and Fittings, and Ridge Rolls, are now available, according to an announcement of the Division of Simplified Practice, National Bureau of Standards.

This recommendation, which establishes a simplified schedule of sizes for eaves trough, conductor pipe, elbows, etc., and fixes a minimum gage weight for metals used in their manufacture, first became effective in 1925. It was reaffirmed without change annually from 1925 through 1932, and again in 1935 and 1937.

The current revision further reduces the sizes of eaves trough by the elimination of the 3½- and 8-inch sizes; adds a 1½-inch diameter plain round conductor pipe, and enlarges the scope of the recommendation to include sizes and styles of box and roof gutters and plain ridge rolls. The revision, according to the Standing Committee, effects an elimination of about 200 items in eaves trough, ridge rolls, and their accessories, and materially reduces the variety of box and roof gutters.

Copies of this recommendation, which is effective from December 1, 1939, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

Toronto A. C. Industries Branch

The Air Conditioning Industries Branch of the Board of Trade of the City of Toronto recently completed another successful year as an Association of those engaged in the Air Conditioning Industries. At the annual meeting, W. G. Mason, The General Steel Wares, Limited, was elected Chairman of the branch for the ensuing year, suc-

ceeding W. H. Evans, The Minneapolis-Honeywell Regulator Company, Limited, with J. W. O'Neill, The Trane Company of Canada, Limited, as vice-chairman.

Those elected to comprise the Executive Committee were C. R. Davis, The Davis Automatic Control Company; H. G. Hill, The Gurney Foundry Company, Limited; R. H. Lock, J. H. Lock and Sons; H. R. Roth, The Canadian Sirocco Company, Limited, and E. C. Williams, The Canadian General Electric Company, Limited, with Mr. Evans as Immediate Past Chairman continuing as a Member of the Executive Committee.

The members of the Air Conditioning Industries Branch received a very satisfactory report by the retiring Chairman upon the activities of the Branch during the past year, in which he outlined the many accomplishments of the Branch during that period. The following were among the various matters given consideration:

Definition of "Air Conditioning"

By-Law No. 224 re Master and Journeyman Electricians

Purchase of Goods Upon Instalment Plan

Proposed Electrical Code

Statistics for the Air Conditioning Industry

Mechanical Refrigeration Code

Customs Regulations re Refrigeration Equipment

Refrigeration Industry

Labour Relations

Water Temperatures

Wet and Dry Bulb Temperatures

Installation of Heating Equipment

Installation of Plumbing and Heating Equipment

National Building Code

Schedule for the Building Industry (Wages, Hours and Days of Labour).

The Chairman, in concluding his report, stated the Branch, during the coming year, would be required to give consideration to a number of matters affecting these Industries, in view of which it was hoped that those engaged in these Industries who are not yet represented in this Branch might soon become associated with it. In this way, the effectiveness of the Branch as an instrument to be used for furthering the interests of the Air Conditioning Industries would be ensured.

Never Before a Stoker Like This!

**Successfully Burns Both
Coking and
Non-Coking Coals!**

**Air-cooled, Oscillating Agitator!
Air Volume Control!**

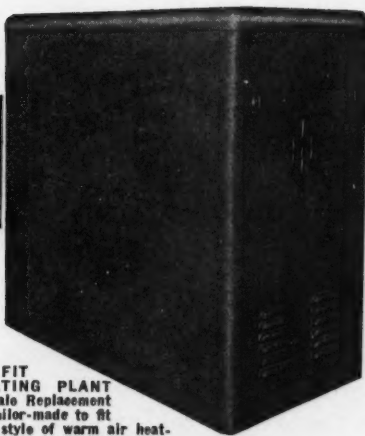
If you are interested in an extremely low cost proven Bin-Fed Stoker that will successfully burn either high or low volatile coking coal and wish to avoid the long delay and high cost of producing one, here is your opportunity to complete your line. We offer our entire Bin-Fed Stoker that you can easily assemble and install with your own name plate on it and sell at a profit.

**Priced As Low
As a Hopper!**

Write
for Full
Particulars

F. D. YARICK
18953 Roselawn
DETROIT MICHIGAN





**MADE TO FIT
ANY HEATING PLANT**
The Char-Gale Replacement
Casing is tailor-made to fit
any size or style of warm air heat-
ing plant. Strongly built, beauti-
fully finished, easy to install.

Just What Your Customers Want!

CHAR-GALE REPLACEMENT CASING

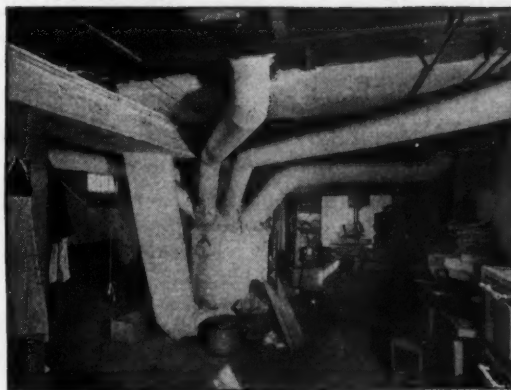
Makes Old Furnaces Look Brand New

You know many a home owner who would like to modernize his basement, yet his heating plant has many years of service left in it and is too good to discard. A Char-Gale Replacement Casing will make his unit look as modern as the newest—at a price he'll like. It opens up a big volume of sales for you on blowers, filters, oil burners, etc., as well as casings, ducts, fittings. It increases property values and adds living

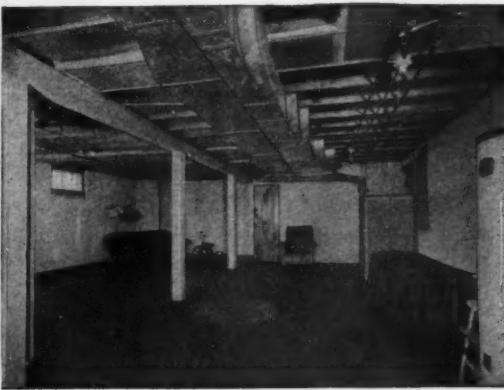
space for your customers—and gives you a big new source of extra profits!

**Write for
CATALOG
No. 40**

Investigate this new merchandising idea at once. Write for catalog giving full details, and prices. Char-Gale also makes a complete line of Pre-Fabricated Ducts and Fittings, and Air Conditioning Registers.



Here is the basement of a home as it looked with the original furnace located in the center of the basement.

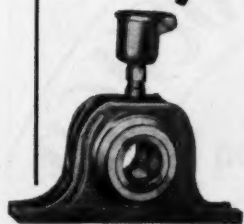


This is the same basement modernized with a Char-Gale Replacement Casing and Pre-Fabricated Ducts and Fittings. What a contrast!

CHAR-GALE MANUFACTURING CO. 3125 HIAWATHA AVE. MINNEAPOLIS, MINN.

YOUR EQUIPMENT NEEDS THESE 5 POINTS OF

Randall **SUPERIORITY**



Randall One Piece
Steel Housing
Pillow Block

Write for No.
40 catalog show-
ing complete
Randall line.

- 1 Quiet in operation. Assures elimination of metallic bearing noise in air conditioning blowers.
- 2 Longer life. Requiring minimum attention in the field.
- 3 Quickly and easily installed.
- 4 Constant self-aligning and self-lubricating.
- 5 Low in cost, economical and efficient in performance.

RANDALL GRAPHITE PRODUCTS CORP.
DEPT. 811, 609 W. LAKE ST., CHICAGO, ILL.

INDUSTRIAL PERFORATED METALS ORNAMENTAL

The H. & K. line offers a wide selection of ornamental and decorative grilles for public and private buildings suitable for radiator enclosures, ventilators and air conditioners. Write for Booklet No. 30.--Industrial screens for grading and separating many products--for safety guarding and other uses. Unusual specifications carefully executed.

**ANY METAL
ANY PERFORATION**

The
Harrington & King
PERFORATING CO.

5649 Filmore St., Chicago, Ill.

New York Office, 114 Liberty St.

Engineering for Attic Fan Sales

(Continued from page 48)

after building, sets up the fan and connects fan to box. The total time for this crew is from 4 to 5 hours.

The second crew gets the opening measurements from the job and builds the grills. Cole-Hagood favors an expanded metal face about 1/4-inch thick which permits looking into the box only from directly underneath the grille. The entire grille is made and painted in the shop and, when installed, the frame of the grille is nailed into the framing around the opening. No painting, therefore, has to be done on the job. This construction eliminates all nails showing to the customer.

Intake Grille Construction

One of the details shows the grille frame in the grille opening. The grille slips into the opening until the trim is flush with the ceiling and the frame is nailed to hold the grille in place as shown in the detail. About 20 to 30 minutes are required to set the grille. By painting the grille (trim, frame and expanded metal) after assembly, the entire job has a workmanlike appearance.

Cole-Hagood engineering is simple, but thorough, and certain practices are insisted

upon. At least 60 air changes per hour are specified, but more air changes are frequently used. The average fan size is 42 to 48-inch (13,000 to 17,000 cfm). The fans blow into the attic and away from the outside grille opening in order to exhaust hot attic air along with air pulled from below.

Exhaust Grille in Porch Ceiling

Exhaust grills usually are placed in porch ceilings, the grille being made of expanded metal, painted and provided with a drop door above the grille to close the attic in cold weather.

Cole-Hagood has been selling attic fans since 1937. In 1939, 75 per cent of all fans sold went into houses already built and 25 per cent into new houses. Most installations have been made in Austin or the immediate vicinity although a few contracts have been in communities up to 75 miles away. Cole-Hagood was one of the first attic fan dealers in Austin. In 1940 there are some 15 firms selling fans and home owners are, today, pretty well acquainted with the possibilities of fan cooling.

The average installed price of attic fans in Austin is approximately \$200 for 12,000-13,000 cfm fans and \$250 for 16,000-18,000 cfm fans. Several makes of fans have been used, but at present Chelsea fans are used exclusively.



Easy Foot Operation with Niagara Gap Shears

It is smart buying to choose a gap shear. 18 inch gap lets you cut sheets longer than cutting length of shear! New modern design provides easy foot operation and convenient handling of sheets. Rigid housings maintain alignment of working parts and accuracy of knife travel. Self-locking eccentrics make it possible to let go of the holddown while stepping on the treadle.

Complete with gages and genuine Niagara alloy steel knives.

Send coupon for Bulletin 80-C

NIAGARA MACHINE & TOOL WORKS
637-97 Northland Ave., Buffalo, N. Y.
Please send copy of Bulletin 80-C.

Name

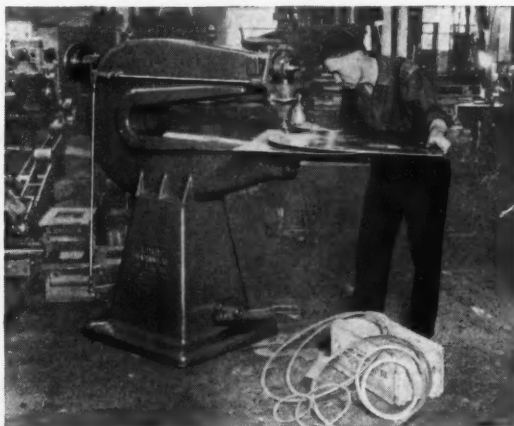
Concern

StreetCity

A. A. - 8-40

NIAGARA

for CIRCLE and RING SHEARING...
and ALL OTHER *Intricate* SHAPES



LIBERT Hi-Speed SHEAR

Intricate Shearing is easy . . . on a Libert Shear. Ring or Circle, splitting, irregular shapes, flat or formed pieces, on all types of metal up to 10 gauge can be finished INSTANTLY without numerous machine changes. Every metal working department can save time, labor and money with the new speed, accuracy, versatility and economy possible with a Libert Hi-Speed Shear. Let us prove this amazing efficiency in YOUR Plant. Ask your Libert Distributor for a demonstration, or write for latest bulletins.

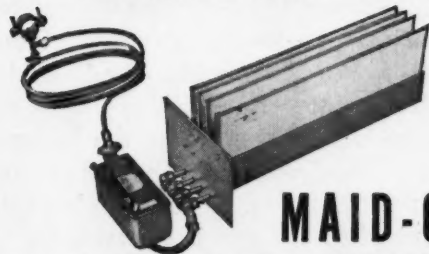
LIBERT MACHINE COMPANY

Green Bay, Wisconsin

Manufacturers of Shears since 1915

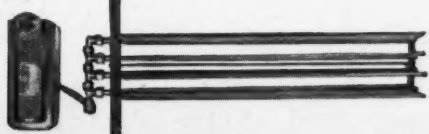
Libert *Hi-Speed* SHEAR

Setting a NEW HIGH
in HUMIDIFIER EFFICIENCY



The
MAID-O'-MIST
CONVECTOR HUMIDIFIER

For forced air, gravity and floor furnaces and space heaters. Offers continuous quick evaporation—even at low temperatures. Made in 18 sizes in single—double and 4 troughs—automatic float feed—or drip feed. Troughs of copper are $\frac{1}{4}$ " wide and on double or 4 trough are spaced 1" apart insuring free unrestricted air flow thru humidifier. Patented metal-edged replaceable evaporators six inches high are of special absorbent material inserted in troughs. Water feeder is of brass, copper and monel metal with all parts including copper float nickel-plated eliminating corrosion trouble. Smallest size is made to fit 16 inch plenum chambers. Both float feed and drip feed are designed to prevent back siphonage and meet all code requirements.



Top view showing air space between troughs allowing unrestricted air flow.

MAID-O'-MIST, Inc.

213 NO. ABERDEEN ST.

CHICAGO, ILL.

☆ **MELLOW** ☆
WARM AIR
FURNACE

selected for

1940 "LIFE HOUSE"

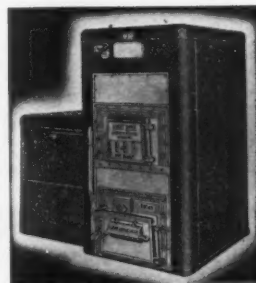
Selection of the MELLOW Warm Air Furnace for the "LIFE HOUSE" in St. Louis County, as well as for the entire Patricia Park subdivision, is proof of the ready acceptance and growing popularity of FRONT RANK and MELLOW Heating Equipment.

FRONT RANK dealers all over the country are cashing in on this growing popularity—as evidenced by thousands of FRONT RANK and MELLOW systems being specified in high-priced homes as well as low-cost housing projects. FRONT RANK offers you a complete line of heating equipment, designed to meet every requirement of modern heating.

"FRONT RANK"

Winter Air
Conditioning Furnace

Combines durability with the latest features that contribute to year 'round comfort, health, convenience and economy. Very beautifully finished in Green Morocco Baked Enamel. Competitively priced!



"FRONT RANK"

Steel Furnace

Tested and proven over a period of fifty-two years by more than 350,000 owners. Engineered and installed to last a life-time. As a dealer, you capitalize on the renowned reputation of this unit!



"MELLOW"

Cast Iron Furnace

Circulates a generous supply of moist, healthful heat. Exceptionally easy and economical to operate. Sturdy construction, assures many years of economical, dependable performance. Easy to sell!



Write, wire, or phone today for complete information! There's still time for you to join FRONT RANK's rapidly growing dealer organization. Get your share of the 1940 heating profits!

FURNACE DIVISION

Liberty Foundry Co.

2500 OHIO ST. • SAINT LOUIS, MO.



COLE'S *gas-fired* FLOOR FURNACE

- A new patented gas burner with an automatic air intake that requires no air adjustment for any kind of gas. Full Bunsen type blue flame will not flash back and ignite in the mixing chamber. Cole's Patented Gas Burner produces a tall, semi-luminous flame about 8 inches high which heats the entire area of the combustion chamber quickly, uniformly, economically.

- An inner heating unit of full vitreous porcelain enamel inside and outside scientifically constructed to provide the utmost in durability and efficiency. Large heating surface and long delayed flue travel assure maximum heat from fuel. Unit is crimped and sealed by the Cole patented process, insuring a gas-tight, stay-tight construction.

- A casing of three-walled galvanized steel construction, consisting of an inner double wall and the main outside single wall. Full porcelain outside casing at small extra cost.

- A combination safety pilot and automatic thermostatic heat control for all Cole Gas Burning Floor Furnaces in the 20-30-40 series.

Cole Gas Fired Floor Furnaces are easy to install in buildings with or without basements. They burn natural, artificial or mixed gas with the same high heating efficiency.

Approved by The American Gas Association.

Get full details today!



COLE HOT BLAST MFG. CO.
3108 WEST 51st STREET
CHICAGO ILLINOIS

News Items

Falso in New Building

Adolph & Armando Falso opened a new heating showroom at 1626 Erie Blvd. East, Syracuse, N. Y., on August 1. The building is 32 x 104 feet, with offices and showroom. The company handles Janitrol and Fox furnaces.

Thompson in Larger Quarters

Thompson Ref. Co., Kansas City, Missouri, is moving into new quarters located at 4724 Troost Avenue, where they will handle a complete line of refrigeration equipment for air conditioning and also a complete line of heating equipment. W. J. Thompson is manager.

Back Numbers of American Artisan

The Municipal Reference Library, 1005 City Hall, Chicago, offers back numbers of American Artisan, as follows:

Vol. 87, Nos. 21-26 inclusive
Vol. 88, Nos. 1-26 inclusive
Vol. 89, Nos. 1-17 inclusive, 19 and 23-25 inclusive
Vol. 90, Nos. 3, 4, 6, 9, 18, 26
Vol. 91, Nos. 1-8 inclusive. 10-26 inclusive
Vol. 92, Nos. 1-8 inclusive. 17-25 inclusive

Heating—Air Conditioning—Refrigeration

The New York State Department of Education has authorized a comprehensive four-year course on Heating, Air Conditioning and Refrigeration which they hope to add to the curriculum of technical and vocational high schools throughout the State next year.

The project was initiated by the New York City Department of Education which is now compiling data for the course in cooperation with an Advisory Board on Industrial Education, composed of selected representatives from leading manufacturers and trade associations in the fields covered by the proposed course.

Cooling Load Reducing Methods

(Continued from page 50)

already available to engineers for windows shaded with other commonly used devices. Since the direct solar transmission varies with the angle of incidence of the sun, the tables include values of incident and transmitted radiation in BTU per hr. per sq. ft. for each hour during the period when the sun is effective on windows at each of seven orientations.

Incident Solar Radiation

"The values of incident solar radiation given in the tables were taken from Tables 2, 3, 4 and 5 in Chapter 8 of the A.S.H.V.E. Guide for 1940. Figures referring to KoolShade were calculated from tests made in our laboratory, all calculated for one day, the twenty-first of July, in order to be useful with the present A.S.H.V.E. method of figuring solar heat gain.

"For convenient reference and comparison we have also incorporated into the tables values of solar heat gain through Bare Windows (single glass) reprinted from Heating, Piping and Air Conditioning issues of May and June, 1938, by permission of Mr. William Goodman of The



No. 40 1/4

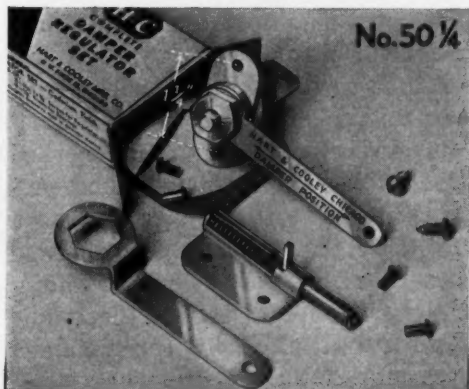
H&C DAMPER REGULATOR SETS

Pick the Type that Suits you Best!

H&C offers four different sets, three of which, in the 1/4" size, are furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature.

ECONOMY TYPE Quality at a Price!
Furnished with both wing and hex lock nuts.
Made only with 1/4" Bearings...No. 40 1/4—List Price 30c Set
Also available with No. 53 1/4 Snap Bearing at same price.
No. 40 1/4 S—List Price 30c Set

HART & COOLEY MANUFACTURING CO.
HOLLAND, MICHIGAN - - Chicago Office at 61 W. Kinzie Street



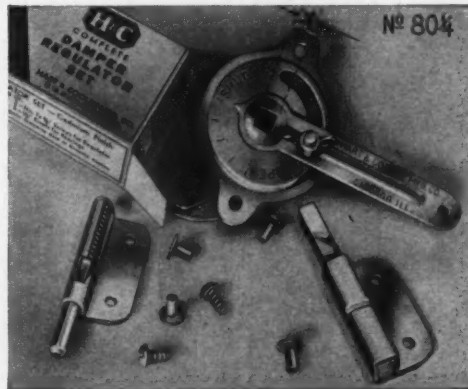
No. 50 1/4

BRACKET TYPE (left)

With 1/4" Bearings—No. 50 1/4
—List Price 40c Set
With 3/8" Bearings—No. 50 3/8
—List Price 60c Set
1/4" size has snap end bearing.

DISK TYPE (right)

With 1/4" Bearings—No. 80 1/4
—List Price 40c Set
With 3/8" Bearings—No. 80 3/8
—List Price 60c Set
1/4" size has snap end bearing.



No. 80 1/4

WHITNEY LEVER PUNCHES

No. 4B PUNCH



Length 8 1/2 inches. Capacity 1/4-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—3/8" to 1" by 64ths.

No. 6 PUNCH



Length—26 1/2 inches. Capacity — 1/4-inch hole through 3/8-inch iron; especially adapted for button punching or temp-let work. Punches and dies 1/4" to 1" by 32nds.

No. 91 PUNCH



CAPACITY

1/2-inch hole through 1/4-inch iron; 3/8-inch hole through 3/8-inch iron; 2-inch hole through 1/2-inch iron. Depth throat, 5 inches. Weight, 82 lbs.

We have tools for every purpose needed by Sheet Metal Contractors.

Ask your Jobber.

No. 1 PUNCH



Length—34 inches. Capacity — 1/4-inch hole through 1/4-inch iron. Punches and dies in sizes from 1/8 to 1" by 64ths.

No. 2 PUNCH



Length—23 inches. Capacity — 3/8-inch hole through 1/4-inch iron. Punches and dies in sizes 3/8-inch to 1/2-inch by 64ths.

CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two Punches interchangeable, including punches and dies. Capacity—1/4-inch hole through 1/4-inch iron.



WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

TRIANGLE Shock Absorbing PILLOW BLOCK

(Patent Pending)



New Type Silent Bearing for Blower Service

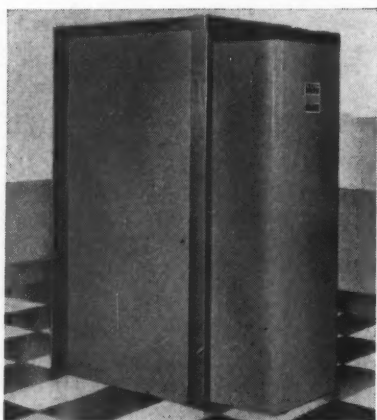
Unique engineering encloses bushing, cushion and oil reservoir in pressed steel ball, making compact unit streamlined to present minimum of air restriction. Built-in, oil-proof, synthetic rubber cushion absorbs vibration. Porous bronze bushing, wick-fed from large oil chamber insures lubrication for exceptionally long periods of operation. Positively self-aligning due to ball and socket action of spherical housing and mounting.

Results! Low cost, increased air delivery, utmost durability and freedom from vibration. Quotations submitted on request.

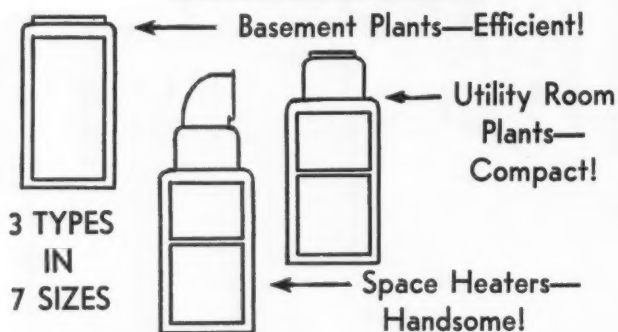
TRIANGLE MFG. CO., 395 Division St., Oshkosh, Wis.

SUN FUEL MISER AUTOMATIC OIL FURNACES

Make You Money and Friends



QUALITY PLUS



From 80,000 to 400,000 B.t.u. per hour

LOOK!—Bonnet Ratings vs. Floor Dimensions

B.t.u. per hr. at bonnet	Floor Dimensions	
	Basement Units inches	Utility Room Type inches
90,000	35 x 36	21 x 36
125,000	24 x 48	32 x 40
165,000	32 x 62	40 x 56

They're PRICED RIGHT
for the

LOW COST HOUSING MARKET

WRITE TODAY!

J. V. PATTEN CO., Inc., SYCAMORE, ILL., U.S.A.
200 DE KALB AVE.

Trane Company.

Calculating Heat Gain by Conduction

"As stated above, data in the tables represent Solar Heat Gain through windows with KoolShade in excess of heat gain by conduction through the glass. Total heat gain is determined by adding the value of heat gain due to conduction through the glass, and if desired, this may be calculated on the same basis hitherto employed for windows equipped with other inside or outside shading devices.

"For increased accuracy, however, we have calculated a set of 'Effective Transmittance' values for KoolShade which permit calculation of Heat Gain by Conduction with due regard for each orientation. The heat gain by conduction does not depend only on the sun angle but on the temperature rise of the air enclosed between the screen and the glass, which varies with the amount of the solar radiation absorbed by the KoolShade over a period of time. Accordingly, for each orientation there is given a single value of Effective Transmittance based on the average amount of solar radiation absorbed by the screen during the whole day. This figure, multiplied by the assumed difference between the outside and room temperatures, gives the heat gain through the window due to conduction."



No other draft control has the famous "Rocking Chair Action" of the FIELD control. This feature, and sound engineering principles executed in sturdy materials, guarantee many years of trouble-free operation. Write us today for information on the new 6" series and special installations.



CONCO ENGINEERING WORKS

DIVISION OF

H. D. CONKEY & COMPANY

MENDOTA, ILL.

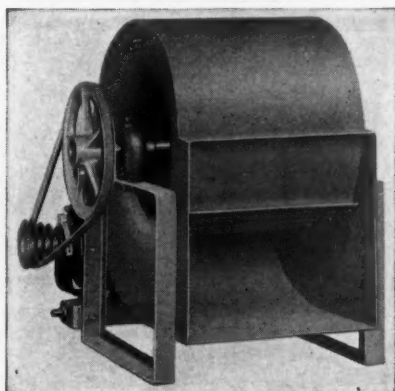
Winter A. C. in a Poultry House

(Continued from page 55)

power boxes for terminals for the zone damper motor wiring.

The usual relief zone was omitted because the use of outside air obviates the possibility of building up excessive furnace temperatures and the low setting of the 2-speed blower causes the blower to operate within a short period after the burner starts. However, the absence of the relief zone necessitated a digression from usual wiring circuits because if the blower operated from bonnet temperature, it would continue after the burner shut-down and expend its energy against closed dampers. These operating conditions were overcome by energizing a blower circuit relay from the protectorelay. In this manner the load of the blower motor is not imposed upon the protectorelay contacts, yet the operation of the blower is dependent upon the burner being in operation.

The sequence of operation which takes place is: A drop in temperature at a zone thermostat causes its zone damper motor to open the duct damper and energize the oil burner protectorelay. This latter control starts the oil burner. In addition, the blower circuit relay is energized and connects the blower circuit into the line so the blower



**Tailored
to fit
your jobs—
REX
BLOWERS**

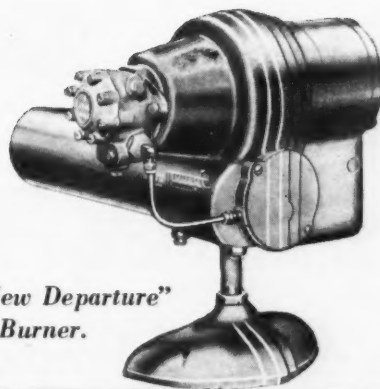
Whenever you plan a forced-air job, feel free to call upon our qualified staff in the field and at our factory for a recommendation.

Without obligation, they will be glad to analyze your problem and recommend the REX Blower that will do the work required at the lowest cost and highest efficiency.

Meanwhile, you will find the REX Blower performance tables (Form No. 196) a valuable aid to proper blower selection. Send for your copy today.

AIR CONTROLS, INC.

Div. of
The Cleveland Heater Co.
1937 West 114th St., Cleveland, Ohio
Eastern sales office: 950 McCarter Hwy., Newark, N. J.
Agents in principal cities.



Our "New Departure"
Burner.

It Stands To Reason

52 Laboratories And Their Engineers Make Aldrich Burners The World's Best

ALDRICH is the exclusive supplier of oil burners for 52 oil burner and furnace and boiler manufacturers whose laboratories and trained engineers constantly strive to make Aldrich-Built burners the world's best.

Aldrich burners **MUST BE BETTER BURNERS** to satisfy all these firms and engineers—and if they are good enough for the best brains in the industry and the world's largest users of burners, then it stands to reason they should be good enough for YOU to sell.

**N
E
W** { Exclusively-Aldrich Engineering Features.
"New Departure" Burners.
"SAV-HAF" Burners For Number 5 Fuel Oil.
Oil-Fired Domestic Hot-Water Heaters and Burner-Boiler Units.

All These Are Reasons Why Aldrich Is America's Fastest-Growing Burner Manufacturer, With The Line That LEADS All Competition.

Aldrich Company
Wyoming Illinois

New Hi-Boy Satisfies All Requirements of The Small Home Field

Tropic Breeze Winter Air Conditioner is Designed for Gas or Oil Firing!

The Dalzen Manufacturing Company of Detroit is reporting enthusiastic trade acceptance of their Tropic Breeze Hi-Boy which takes only 26" x 27" of floor space, yet is not too high for cellar installations.

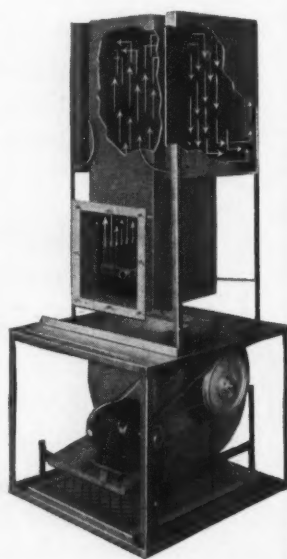
This Winter Air Conditioner packs an abundance of air capacity with its 12" blower and has a comfortable "plus" heating capacity. It is designed for either gas or oil firing, the purchaser having a choice of two oil burners (gun or mechanical draft pot) or Dalzen Multi-Tip gas burner. Another unusual selling point is the ability of the owner to switch later from gas to oil or oil to gas at small expense.

This Hi-Boy is beautifully finished in blue or green Hammerloid and is shipped as a completely assembled, packaged product which will pass thru a 28" door.

The unit ideally meets today's volume demand for a modern winter air conditioner in a size and price range which will fit the small home requirements.

Dalzen also manufactures the Multi-Tip Conversion Gas Burner which is installed easily and quickly in any type of heating plant. Thermostatic and safety controls are included with each unit and it is priced to sell easily in competitive markets.

For complete details of either the Tropic Breeze Winter Air Conditioner or the Multi-Tip Conversion Gas Burner, write Dalzen Manufacturing Co., 511 Leib Street, Detroit, Michigan.



Skeleton phantom view

is ready to operate when the bonnet temperature reaches the setting of the 2-speed controller and limit control. As burner operation continues, the 2-speed controller energizes another relay which opens the low speed blower motor circuit and closes the high speed circuit.

To augment the summer ventilating system, a double-pole, double-throw switch was placed in the circuit. The summer ventilating position of the switch is indicated by a red pilot light and when in this position the oil burner circuit is inoperative.

The building heat load was computed at 73,160 Btu. per hour at 70 degrees temperature difference. Fresh air was computed at 2000 cfm. which is equivalent to 5 changes per hour. The heating load to raise the temperature of this air to 70 degrees and the total load is indicated in the following calculations:

Fresh Air Load 2000	(.018 × 60 × 70)
	=151,200 Btu. per hour
Building Load	= 73,160 Btu. per hour
Total Load	=224,360 Btu. per hour

Register temperature was determined from the amount of temperature rise (register temperature — room temperature) required for 2000 cfm. to furnish 73,160 Btu. per hour and is expressed in the following:



*Draftless
Air
Distribution*

venturi-flo

WITH LIGHTING FIXTURE

These new ceiling air outlets (available in many sizes and various types) provide an ideal combination of beauty and utility. The capacity of the lighting unit has been designed to match the coverage of the air supply capacity, thus entailing no sacrifice of either service. Please write for further information and specifications.

BARBER-COLMAN COMPANY
ROCKFORD • ILLINOIS

$$\text{Temperature Rise} = \frac{73,160}{60 \times .018 \times 2000} = 33.8^\circ$$

Register Temperature = $33.8 + 70 = 103.8$ deg.

The unit being located within the occupied portion of the building, all heat dissipated by the casing, smoke-pipe and ducts is utilized and allows a capacity based on bonnet output:

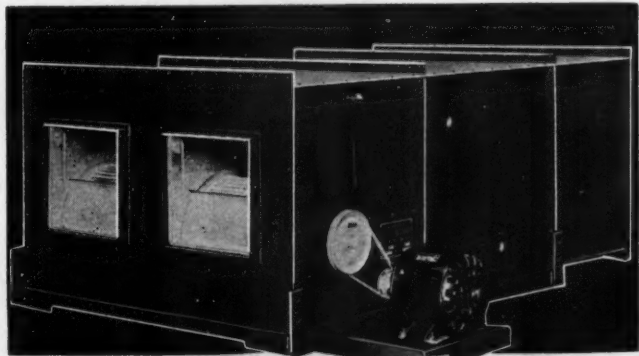
$140,000 \text{ (Btu. per gal.)} \times 1.65 \text{ G.P.H.} \times .85 \text{ (efficiency)} = 200,000 \text{ Btu. per hour (approximate).}$

An increase in firing rate, with a reduction in efficiency, indicates the following capacity:

$140,000 \text{ Btu.} \times 2.00 \text{ G.P.H.} \times .80 = 224,000 \text{ Btu. per hour (approximate).}$

The above figures indicate the unit would reach its capacity when fired with a 2-gallon per hour nozzle on a zero degree day. However, the calculations for the load do not allow for the poultry as a source of heat generation and research did not disclose any authoritative information that could be used with confidence. Deliberate consideration of the problem indicated it should be conservative to base capacities on requirements and allow other sources of heat to apply toward the usual safety factor.

During January last, the unit reached its capacity at 20 degrees below zero while fired with a 1.65 G.P.H. nozzle. This indicated the heat gen-



CLORAGE

Designed to control temperature and humidity within close limits. Can be made completely automatic in operation, regulated by room thermostat and humidistat.

Multitherm Units

- ✓ Cooling
- ✓ Heating
- ✓ Complete Conditioning

Finest type of equipment available for small summer cooling, winter heating or complete year-round air-conditioning jobs. Widely used in factories, offices, stores, etc. Highly efficient; remarkably compact; easily installed in any idle space.

Write for Bulletin 107 describing various arrangements and giving capacity ratings.



CLORAGE FAN COMPANY
872 PORTER STREET • KALAMAZOO, MICH.
Sales Engineering Offices in all Principal Cities



THE New NO. 250 CAMPBELL NIBBLER

HAS THESE

4 New ADVANTAGES

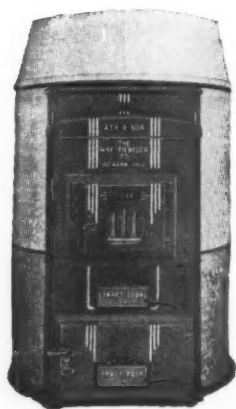
Cuts Wider Stock—takes $\frac{1}{4}$ " mild steel and $\frac{3}{16}$ " stainless up to 72" wide. Depth of throat 36". Has Three Speeds—350, 500 and 800 R.P.M. with easy change-over. Stroke Is Adjustable—can be set for any stock thickness from very thin to capacity of machine. Permits convenient use of thin templates. Cuts in All Directions—while the operator keeps a two-hand grip on the material.

BUY ACCO QUALITY in Campbell Cutting Machines; Ford Chain Blocks and Trolleys; Page Welding Electrodes; American Chains; Lay-Set Preformed Wire Rope; Reading-Pratt & Cady Valves; Page Wire Fence.

ANDREW C. CAMPBELL DIVISION
Designers and Builders of Special Machinery
BRIDGEPORT • CONNECTICUT
In Business for Your Safety



AMERICAN CHAIN & CABLE COMPANY, Inc.



ATH-A-NOR

*Over Fifty Years
of Quality Heating*

The key to business success is, in a large number of cases, customer recommendation. You'll find that a good furnace job that performs season after season with little or no attention, and giving top performance all the way will be one of your best assets.

You can be sure of modern, efficient heating on all those jobs if you install the time-tested ATH-A-NOR. Here's a furnace that will perform on either gravity or air conditioning jobs with equal facility. Strong construction, modern appearance, efficient performance . . . they all add up to one thing, better jobs and better profits. Write today for more information.

THE MAY-FIEBEGER COMPANY
NEWARK OHIO

BENDING
BRAKES

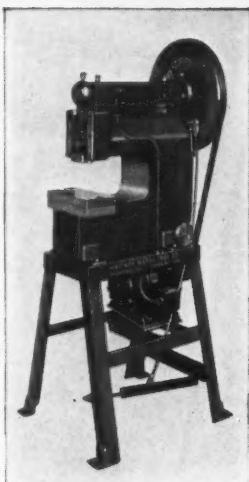
WHITNEY-JENSEN

METAL
TOOLS

No. 129
12" Throat Depth

No. 130
18" Throat Depth

**HEAVY-DUTY
MOTOR-DRIVEN
PUNCH**



Check these features for VALUE! Capacity 10 tons. Length of stroke, 1 1/4". Stroke adjustment, 1 3/4". Die space, stroke down, adjustment up, 4". Depth of throat, two sizes, 12" (No. 129) and 18" (No. 130). Complete with motor. Guaranteed. Standardized construction. Punch and die service available.

Powerful • Accurate • Durable

Box-section frame of welded steel plates. Welded angle iron base. Accurately machined. Adjustable wear gibs. Bronze bearings on all rotating parts. Please write for new circular and complete information.

WHITNEY METAL TOOL CO. • 91 Forbes Street, Rockford, Illinois

erated by the chickens and, in this case, laboratory operations was considerably more than we allowed. It appears conservative to design this type of plant on the basis of requirements and allow other sources of heat to become the safety factor. However, it would be imperative that all factors bearing on total load should be reflected in the calculations.

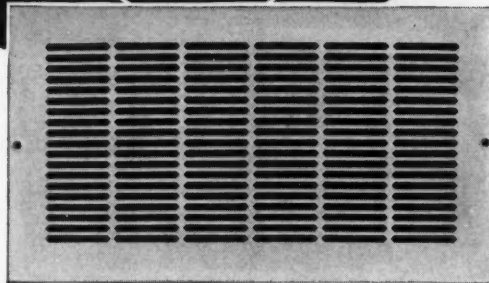
A simple automatically-fired winter air conditioning system, with an accurate temperature control arrangement, is an asset to the modern poultry house. While control of both humidity and temperature would appear to be ideal, the investment in equipment and space may show the economic value of the project to be questionable. The system described provides an economical means for management to coordinate heating, ventilating and humidity.

Operating conditions will vary with circumstances and present varying problems. But close cooperation between the engineer and the client will contribute toward a successful conclusion. We were distinctly fortunate to enjoy the cooperation of the entire Hales and Hunter Company personnel, the counsel of L. G. Neel, Poultry Mash Department Manager, and J. W. Schroeder, Laboratory Manager.

The above paragraphs are by no means authoritative. They are written by a practical engineer rather than a poultry raiser. They are intended



LOW
PRICED
R-600
SERIES



NEW ...IN DESIGN
...IN APPEARANCE
...IN PRICE

An economical register for builders of low cost homes—offering the same fine craftsmanship that has characterized Waterloo Registers for nearly 40 years. Get details on the R-600 series today!

WATERLOO REGISTER COMPANY
Waterloo, Iowa—Seattle, Wash.
Representatives in Principal Cities

to present the considerations which have to be given to such a problem. The operation of a battery plant is a biological manufacturing process and cannot be controlled specifically, as in mechanical processes, because the problems deal with life. Heating and ventilating is a subdivision of housing and must be coordinated, by intelligent management, with the feeding and breeding program because each factor contributes its share toward the economic success of the plant.

Obituary

George W. Ball Dies

McClure & Ball, Worcester, Massachusetts, announce with regret the death of George W. Ball on July 3, 1940. The sheet metal contracting business will be continued, without change of name, and conducted by Edmund D. McClure.

Wife of Oscar Hodgson Passes

Friends and business acquaintances of Oscar Hodgson, heating, roofing and sheet metal contractor of Barberton, Ohio, regret to learn of the death of Mrs. Hodgson on June 27th.

Mr. Hodgson has been an active association member, having served as president of The Ohio Street Metal Contractors Association and during his 24 years activity has always given freely of his time to attend and show interest in the National Warm Air Heating and Air Conditioning Association.



The RESEARCH (WALTON) RE-FIL-ABLE AIR FILTERS

Here's profitable air filter replacement business! Research (Walton) Air Filters are top-notch performers, laboratory tested for an efficiency of 93% removal of standard code dust, a low air flow resistance, and a high dust holding capacity. The

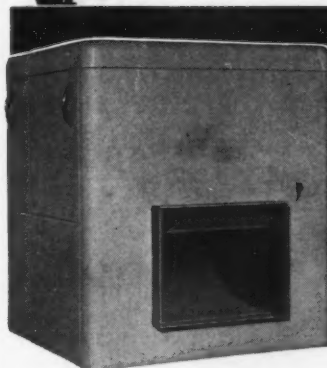
low cost appeals to home-owners, and the ease and economy of replacing filter elements is winning quick acceptance with manufacturers and dealers. Write TODAY for EXTRA PROFIT dealer plan and sales helps.



RESEARCH PRODUCTS CORP., MADISON, WIS.



Salute the Country's BIGGEST VALUE



US AIR CO
SIGNIFICANT NEW
BLOWER - FILTER
UNIT

HATS OFF TO A
GRAND VALUE

Write USAIRCO Today. Get the folder that pictures and describes all the extra-value features. Insulated floor — two access doors, air tight cabinet and filter locking device. Each capacity has far greater filter area. Vari-speed motor, furnace-stat and many more features. You can close more sales — make more profit, when you give the consumer more for his money. Write USAIRCO today!

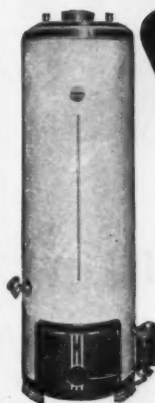


Write for special data on wheels, housings and light duty assemblies.

UNITED STATES AIR CONDITIONING CORP.
NORTHWEST TERMINAL
MINNEAPOLIS, MINNESOTA, U. S. A.

VIKING

Retails as low
as \$75.00 installed!



Fully Automatic, Insulated, Enamel finish.

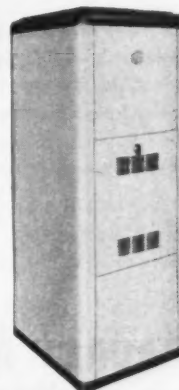
OIL BURNING
WATER HEATERS
that Really Perform!

Viking has built up a reputation with the trade as the water heater that works. Always dependable! Has features not found in other heaters at much higher prices. Fully automatic and manual Models, 20 to 45 gallons capacity. Equipped with BREESE, world's simplest oil burner, shelf or door mounted for easy inspection and lighting. Write for catalog.

OIL BURNING FURNACES for the Smaller Capacity Field

Viking offers you a complete line of specially designed big-value units, rated from 55,000 to 100,000 B.T.U.'s—the fastest selling line in the field. Completely automatic, amazingly efficient winter air-conditioners for basement or utility room installation. Write for Viking furnace catalog and make comparisons!

VIKING MFG. CORPORATION
12602 Greenfield Ave. Detroit, Mich.





★ ★ ★ PROFITS APLENTY IN GRAVITY HEATING

No, you probably won't make your life fortune out of it . . . but there IS plenty of money in soliciting and installing gravity heating jobs. Gravity Heating is economical, clean and efficient and when the proper unit is installed

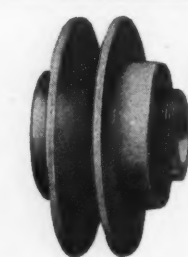
there is no fear of call-backs to eat into the profits.

You can certify the performance and permanence of YOUR jobs by installing the Mt. Vernon "Vernois" Furnace. Strongly constructed of "Vernalloy," a long-lived, heat-resisting alloy, and designed to provide the maximum in heating comfort, this furnace will help you reach the top in gravity heating installations. Further information is yours for the asking . . . better write us NOW!

MT. VERNON FURNACE & MFG. CO. MT. VERNON ILLINOIS



MAUREY



PULLEYS

MAUREY Variable Pitch and Steel V-Pulleys have long been leaders in the field of Fractional Horsepower Transmission. They are installed in the products of the leading manufacturers of Stokers, Blowers, Fans, Air Conditioning and Refrigeration Units.

The latest MAUREY development is the New Cast Iron V-Pulley. It is made with oval instead of the usual flat spokes, providing better weight distribution, strength and balance, for smooth, quiet, vibrationless running at high speeds. Annealed to prevent internal stresses and strains. Grooves are machined with micrometer accuracy to insure longer belt wear.

If your jobber cannot supply you with MAUREY V-Pulleys, or if you have a problem in F. H. P. Transmission to solve . . . write us. Large stocks carried in a wide variety of sizes for both "A" and "B" belts.

WRITE FOR CIRCULARS AND PRICES

MAUREY MANUFACTURING CORP.
Wabash at 29th, Chicago, Illinois

F. H. A.'s 1940 Campaign

(Continued from page 86)

ing Act. It is a brief merchandising manual for dealers suggesting means by which they may increase their sales through the FHA plan of installment payments.

Both the display material and literature are available to all dealers wishing to be identified with the national modernization program, but it will be sent only on direct request. To avoid duplication, manufacturers and trade associations should have the dealers themselves send in their orders. It is suggested that this be done as soon as possible, since quantities are limited, and it is a case of "first come, first served" in filling requests.

Specimen newspaper advertisements are also prepared by the Federal Housing Administration for dealer use. These are mailed in proof form to local newspapers, who will be supplied with mats of the art work on request. A car card will be released for national distribution in trains, cars, and buses. Special radio programs are being arranged locally by State and District Offices of FHA. In addition, manufacturers, dealers, and others will be provided, upon request, with scripts and commercial announcements by

A FAST WORKER!

Premier Furnace Cleaner

Time means money to you in this rush season. This new Premier is built for fast action—and it does a thorough job. It's easy to carry—weighs less than 50 pounds. It's

easy to use—one man can operate it. The cleaner can be used independently from the container for suction and blowing use in cleaning air ducts, registers, grills, radiators and air conditioning equipment.



**New Improved Model —
Completely Equipped
5/8 Horsepower 69⁵⁰
1 Horsepower 89⁵⁰**

Complete Chimney Cleaning Equipment
only \$9.00.

ELECTRIC VACUUM CLEANER CO., INC.
1734 Ivanhoe Road Cleveland, Ohio

which their products may be tied in to the national program for Home and Business Property Modernization. A special transcription of dramatized radio "spots" suitable for dealer tie-in will be made available through local radio stations.

It is anticipated that a technicolor movie, similar to last year's "Miracles of Modernization" will be prepared for release to motion picture houses all over the country. Such a film would show actual transformations that modernization can make in a series of colorful "befores and afters." It is estimated that nearly 100,000,000 people view these FHA-sponsored films.

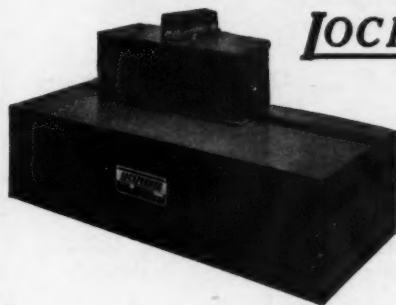
Getting Back To Fundamentals

(Continued from page 41)

living in metal roofing can do something by insisting that every job he does follows standard practice and by analysing for the customer every job which goes to a competitor so the right and wrong methods will be thoroughly understood.

This industry knows there is nothing wrong with copper as a material, but much can go wrong when copper is improperly used. We must bestir ourselves, then, or metal roofing will slide out from under us as other former metal applications have gone.

**YOU MAKE \$25⁰⁰ EXTRA PROFIT
EVEN ON A SMALL JOB
When You Use a . . .**



LOCKFORMER

"24"

(A Pittsburgh Lock Rolling Machine . . . also available with Power Flanger Attachment as shown.)

You don't need big jobs nor a big shop to make a Lockformer 24 pay for itself quickly. Figured on a conservative basis of 2½¢ per pound savings, a 1000 lb. job means an extra \$25.00 . . . and six such jobs more than pay for the "24".

That's why the 24 is practical and profitable for even the smallest shops . . . why the LOCKFORMER is the largest selling machine of its kind in the world . . . why common sense says, "Let's find out about it right away!"

WRITE FOR LITERATURE

THE LOCKFORMER CO.

4615 ARTHINGTON STREET, CHICAGO, ILLINOIS

AJAX

**A NEW LINE OF
PREFABRICATED DUCTS and FITTINGS**
for Forced Air and Air Conditioning Installations



Our Catalog "A" (Gravity Fittings), Catalog "B" (Forced Air Fittings) are yours on request.

**THE CINCINNATI
SHEET METAL & ROOFING CO.**

Furnace Fitting Department

230 E. Front St.

Cincinnati, Ohio

ATTENTION!

One of our clients has authorized us to announce their desire to communicate with individuals or companies who possess a thorough knowledge of domestic heating problems and who are seeking an opportunity to represent a substantial corporation in a sales capacity.

The product is a complete line—5 sizes—of winter air conditioning units, both oil and gas fired. This line of equipment is unquestionably one of the finest lines in its field, made to sell in the volume price range.

The types of individuals and companies wanted are those capable, financially and otherwise, of giving the product an attractive, local display and aggressive organization sales effort on an exclusive, special factory representative basis and in a liberal area. The over-riding compensation is unusually generous and the merchandising plan complete in all details.

Individuals or companies qualified for a major sales assignment of this nature are requested to write at once for full and complete information. A number of the best sales areas in the United States are as yet unassigned.

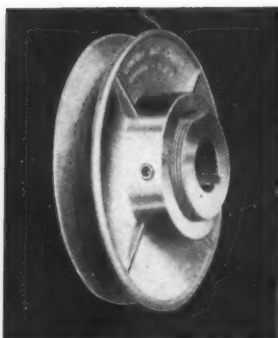
Address

EVERETT L. BOWERS INC.

Advertising & Marketing Counsel

681 Ellicott Square

Buffalo, N. Y.

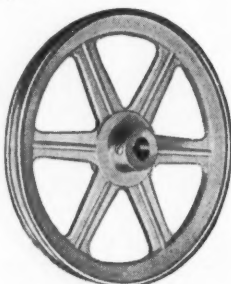


NO FAILURES ... When the equipment You sell is driven by CENTRAL PULLEYS

Frequent call-backs because pulleys have failed are very often expensive and annoying to the dealer who installed the unit. YOU can be certain the equipment you install will perform season after season with little attention if you make sure they're driven by CENTRAL Pulleys!

These superior pulleys are made of white brass, die cast to give exceptional service on any stoker, blower, air conditioning or refrigeration unit. Silent and true-running CENTRAL pulleys will make your first installations perform indefinitely at top efficiency.

Literature and prices are available. Write today!



2735 WEST 47TH STREET

Chicago, Illinois

"Honest To Goodness Human Beings Run Williamson Company"

"The Williamson Heater Company:

We're taking 'time out' for just a few minutes to express to you our appreciation of what your company IS, HAS and STANDS FOR to us as a jobber of Williamson equipment.

To us, the Williamson Heater Company is an organization devoted to the manufacture of the finest warm air equipment in the field — an organization manned by the highest type of individuals to be found anywhere.

As a jobber of 'Williamson' equipment, we are appreciative of the fact that the Williamson Heater Company is composed of honest-to-goodness human beings engaged in the manufacture of equipment that represents a standard of perfection in the heating field."

Signed— X Y Z, Alabama.

Complete information; name, address of writer of above letter furnished on request. Phone, wire or write The Williamson Heater Company.

FREE: Complete, easily understood short method for figuring air conditioning job. You can complete your figures, price job in one hour flat. Write Dept. No. 2. The Williamson Heater Company, Cincinnati, Ohio.

Complete Line Quick Service
WILLIAMSON
WARM AIR FURNACES
1890 — Golden Anniversary — 1940

Dingle— Bookkeeping

(Continued from page 81)

for wages, for materials, or for expenses. We teach our bookkeepers that money is merely a medium of exchange and has but little value except for that purpose. It is not something to get a thrill out of, nor is it something to be disregarded. It is the perfect lubricant for the rough highway of life and if we treat it with respect, it will respect us. That will be good for you, too, and if you will recognize the fact that you have your money in many places, some seen and many unseen, you will realize the need of adequate safeguards for your money wherever it may stray. The only adequate safeguard for any business man is a properly designed and installed set of books, presided over by a capable and trustworthy bookkeeper.

Bookkeeper Is a Good Investment

That bookkeeper will, under such circumstances, prove to be worth real money to you. You will be further safeguarding your money, even though you are put to the additional expense of employing a bookkeeper. You might say that is adding expense to expense, throwing money after money. That's what you have been doing ever since you went into business. You took your money out of

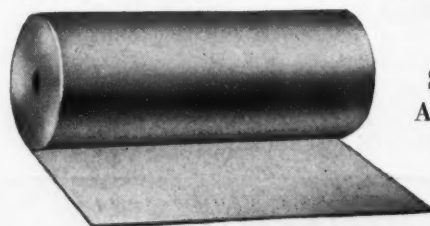
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NOW is the time to get Warm Air Heating Equipment in shape for the winter season.

See your nearest Jobber; he can furnish you with the proper type of SAL-MO insulation; Plain and Corrugated Asbestos Papers, Furnace Cement, Pipe Coverings, etc.

SALL MOUNTAIN COMPANY
176 West Adams St. Chicago, Illinois



SAL-MO
ASBESTOS
PAPER

ASBESTOS

the bank, where it was of but little worry, needed no insurance or safeguarding and put it in equipment, merchandise, and many other things, and then took out insurance to protect you in case of fire or windstorm. You hired men to help you and then covered them with insurance to protect you against loss by accident or injury.

Why not go a step further and hire a bookkeeper to insure your intelligent safeguarding of your money in its many forms and places. We can assure you that your dividends from this source will be far greater than you are receiving from some of your other investments. Of course, we want to caution you about just hiring a so-called bookkeeper and leaving her to her own devices. Remember that a workman must have good tools and the bookkeeper's tools are not just a pen and a bottle of ink. She requires a well designed and properly installed set of accounts; then a suitable place in which to work; and last, but by no means least, she needs close co-operation of the entire organization. The workmen must see that they report the transactions originating with them; you, Mr. Boss, must make it your business to see that the bookkeeper gets your full co-operation, and does not have to guess as to what you are doing. Get all transactions, of every kind and character, on those records, and when she has

✓ *Accurate*
✓ *Convenient*
✓ *Complete*

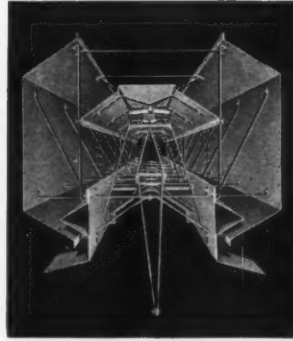
... That's the story behind the success of **AMERICAN ARTISAN'S** Annual Directory, published each January. Its completeness, accuracy and convenience have made it indispensable to engineers and contractors throughout the year for reliable reference in their buying and specifying work. Further information gladly sent on request.

KEENEY PUBLISHING COMPANY
6 North Michigan Ave. Chicago, Ill.

BURT MONOVENT

Continuous Ridge

VENTILATOR



**INDUSTRIAL
BUILDINGS**
Afford Big Market

**We can make
Prompt Deliveries**

The Rearmament Program is calling for quick erection of many kinds of buildings. All require good ventilation. Monovent is ideal for many reasons . . . can be installed on any type of roof without special tailoring on the job . . . costs 1/3 less than unit ventilators of same capacity . . . available in all metals . . . sturdy and simple. Remember, too, Burt makes a complete line of roof ventilators, all types and sizes. Do not hesitate to call on Burt Engineers to help you estimate and lay out plans.

THE BURT MFG. CO.

ROOF VENTILATORS • OIL FILTERS
EXHAUST HEADS

301 Main St., Akron, Ohio

SEND
FOR CATALOGS

Burt Engineers
are glad to
help on plans

You'll find Modern Design in NIAGARA Furnaces

THE eye appeal makes a buy appeal in Niagara Winter Air Conditioning and gravity units. Gas Furnaces... Copper chrome cast iron; or... Toncan iron heat exchangers... selection of belt or direct drive blowers with two-speed control... summer-winter switch... modern casing design... concealed controls... high efficiency... low prices... A.G.A. approved... are features appreciated by home owner and builder alike.

Also coal and oil-fired furnaces.

THE FOREST CITY FOUNDRIES CO.

2500 W. 27TH ST.

CLEVELAND, OHIO

ESTABLISHED 1890

ATTRACTIVE TERRITORIES ARE OPEN FOR
ESTABLISHED DEALERS • WRITE FOR DETAILS

SAVES 2 to 3¢ PER POUND!



Based on figures given us by actual users, a LOCK-FORMER saves from two to three cents per pound of metal fabricated, or an average of \$2.50 per hundred pounds.

Figure it out for your own shop. You'll find that the question is not, "Can we afford it?" but, "Can we afford to be without it?" Your Lockformer Distributor will be glad to demonstrate a Lockformer right in your own shop without any obligation.

WRITE FOR FULL FACTS



NO OTHER LOCK ROLLING MACHINE HAS ALL THESE FEATURES → → →

COLD RUNS BANISHED!

WE'RE DONE FOR JOE—THEY PUT IN A VICTOR HEAT BOOSTER

WITH THE *Furnace Man's Friend*

THE VICTOR HEAT BOOSTER

This amazingly effective device not only boosts hot air into hard-to-heat rooms, it boosts profits into the pocket of the furnace man.

The Victor Booster needs only to be set in place, plugged into any electric outlet, and out pours a rich flow of hot air—not from an overfired furnace, but from an ordinary everyday fire. Two models, floor and wall. Liberal Discounts. Write today for detailed literature and prices.

VICTOR ELECTRIC PRODUCTS, Inc.
Dept. HB-1, 2950 Robertson Ave. Cincinnati, Ohio

ASK YOUR JOBBER OR WRITE DIRECT

prepared a monthly report, take time out of your otherwise full day and see that you fully understand all that is there shown. Don't be afraid to talk it over with the bookkeeper. She can teach you how to read an operating statement.

This done, you will be well able to answer the question asked at the top of this article. **YOU WILL KNOW WHERE YOUR MONEY IS.**

House Flashing With Lead

(Continued from page 71)

laid in not greater than 8-ft. lengths, loose-locked together, with the locks filled with non-hardening compound. Also, there should be an expansion joint midway between the outlets. Make sure, moreover, in order to waterproof the intersection between the gutter and the house framing, that the lining is turned up on the roof slope as far as possible under the roofing material without being punctured by nails. On the face of the gutter, the lining laps over the trim about 1/2 in.

This small New England house, in which all these installation points were carefully followed, is a truly remarkable example of high-class sheet-metal work. George C. O'Neill, of Stamford, was the sheet-metal contractor. William Walsh, of the same city, did the installation work.

Become the LEADING MERCHANT IN YOUR TERRITORY WITH

Gar Wood

HOME COMFORT-PROVIDING EQUIPMENT

SUSTAINED LEADERSHIP

Gar Wood automatic home heating and air conditioning furnace-burner units led the nation in percentage of total sales in 42 key markets for the last four consecutive years—according to statistics published by a national trade authority. Cash in on Gar Wood's sales popularity. Become a prosperous leader in your community. Write or wire for the Gar Wood franchise facts.

PRODUCTS

Oil- or gas-fired automatic Tempered-Aire Winter Air Conditioning and Heating Units—Split Systems—Boiler-Burner Units—Conversion Oil Burners for existing Boilers or Furnaces—Domestic and Commercial Water Heaters—Ventilators—Airdux System for air distribution and control. Ask or write for descriptive literature.

Tempered-Aire Units

Conversion Oil Burners

Boiler-Burner Units

Sell NATIONALLY ACCEPTED PRODUCTS

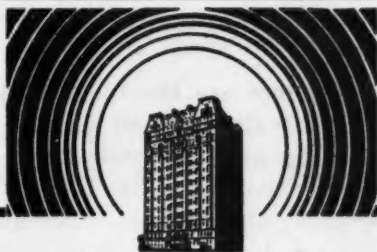
GAR WOOD INDUSTRIES, Inc.
AIR CONDITIONING DIVISION • DETROIT, MICHIGAN
CANADIAN DISTRIBUTORS: ENGINEERING INDUSTRIES, LTD. TORONTO, ONT.

Kruckman's Washington Letter

(Continued from page 42)

The fix-it, paint-it, refurbishing campaign in the Waverly district at Baltimore has been amazingly successful, according to the Home Owners Loan Corporation. In addition to the \$50,000 spent on minor sprucings-up, over 200 householders have expanded somewhere between \$250 to \$500 each on furnaces, roof jobs, gutter jobs, chimney repairs, and similar work. It is estimated about \$80,000 has been spent in this way, and that almost all of it went to the neighborhood shops over on Greenmount Avenue, the Waverly business street. What sounds better still is the report that during the coming two or three months at least 500 more householders will have similar jobs done at a cost of almost \$200,000.

The Waverly people regard the campaign as the most vivifying experience of their lives. All "For Sale" signs in the area are down, there is not a house for rent, and the Home Owners Loan Corporation has disposed of 11 houses it had on its hands. Moreover, a man living in the vicinity, who owns an equity in the only large vacant space left in the neighborhood, has taken over the lots and is building 20 new houses which will have an average value of \$4,500 each, and which he expects to sell easily to workers of the area. There is so much new pep and drive and pride in Waverly that the property owners and the residents have formed the Waverly Conservation League, consisting wholly of the local people. The Federal Government had nothing to do with the initiative for the League, and it has had nothing to do with the momentum that started it, except the original survey by the WPA and the plan which launched the idea. Under the leadership of a local man, a property owner, Joseph Watson, the League is about to promulgate a 20 year plan for the conservation of the district.



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always a center of activity

giving to every occasion its very own atmosphere of gracious dignity and prestige. You will like its modern comforts and its reasonable rates.

BELLEVUE STRATFORD

IN PHILADELPHIA

CLAUDE H. BENNETT, General Manager

AIR-CONDITIONED RESTAURANTS

**NO OTHER LOCK ROLLING MACHINE
HAS ALL THESE FEATURES!**

LOCKFORMER 22

1. ONE PIECE ROLLS. GEARS AND SHAFTS. No possibility of Mis-alignment, no taper pins or key ways to cause trouble.
2. ROLLER BEARINGS THROUGHOUT. Minimum power requirements, minimum wear, friction and maintenance.
3. AMPLE RESERVE CAPACITY. All Lockformers handle their maximum gauge easily.
4. NO ADJUSTMENTS FOR GAUGE. Fool-proof, nothing to change or to "forget" to change.
5. UNIFORM HAMMER. OVER EDGE... regardless of number of notches made.
6. NO RESQUARING OF SHEETS. Pittsburgh Lock will not run off edge of sheet.
7. LOCKS ALWAYS UNIFORMLY OPEN. No further prying open necessary, easier and quicker assembly.
8. SETS UP FOR 3 JOBS. Pittsburgh Lock rolls are not disturbed when auxiliary rolls for Drive Cleats, or Double Seam rolls are in use. Power Flanger Attachment turns right angle flange on straight or curved pieces.
9. TESTED AND PROVED IN HUNDREDS OF SHOPS. More Lockformers are in use than all other makes of Lock Rolling Machines combined.
10. UNCONDITIONALLY GUARANTEED IN WRITING.

WRITE FOR FULL FACTS

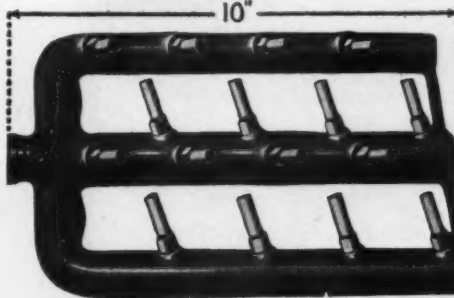
THE LOCKFORMER CO.
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← ← ← ← ← ← SAVES 2 to 3c PER POUND

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The largest selection of Burner Units on the Market. The Barber way is to adapt the Burner to the Appliance. Your problem is our problem—let us help you!

Efficiency!
Economy!
Performance!
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BARBER Automatic JET GAS BURNERS

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INCREASED SALES and PROFITS

Are assured if you sell Hess equipment. Why sell ordinary furnaces as sold by mail order concerns and other competitors when Hess offers superior value and performance at low prices.

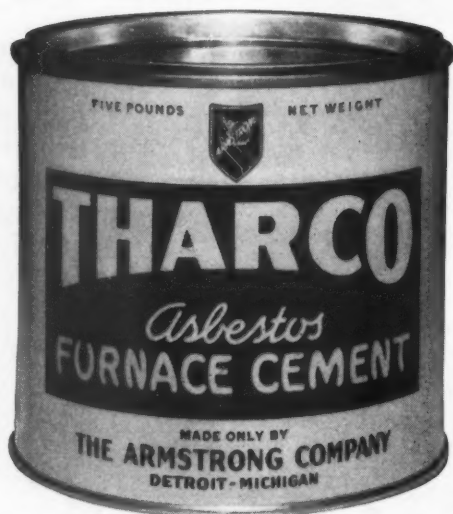
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It's Different and Better.

The Hess furnace is rectangular throughout with heavy welded steel innerbody. Hess blower-filter units, oil burners, stokers and accessories, fill every dealer requirement. Exclusive territory protection. Free plan service. FHA terms. Free consumer literature gives every advantage to a Hess dealer.

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THE STANDARD FOR 30 YEARS!



Leading manufacturers and furnace repair men have found Tharco "tops" in every way. Why not try it? On sale at leading jobbers.

MANUFACTURED ONLY BY
THE ARMSTRONG COMPANY
DETROIT DALLAS CHICAGO

Copper Roof That Failed

(Continued from page 75)

from the rest of the job, fit together on the roof. The boards varied in thickness and regularity. Consequently they caused bulges, bumps and ruptured the surface of the roof.

To have replaced the carpentry work would have cost a small fortune. By substantially repairing the copper and installing expansion joints and contraction joints we securely reconditioned the roof so that no alteration in the woodwork was necessary.

"Simply soldering over a crack is not going to make it hold," says Albert L. Saffell, who has had 22 years' experience at the trade. "You can not make solder expand and contract," he adds. Saffell was the mechanic in charge of the College repairs.

How Roof Was Repaired

Several inches around every split was cleaned with raw acid until it was bright as a new mint dollar. (See picture 2.) This area was then well tinned with 50/50 solder made for Gichner, Inc., and bearing their label. On top of this area a patch was sweated and soldered. The patch was also pretinned before application. (See picture 3.)

Longitudinally along valleys and across decks, standing seam expansion joints (Type "A") were installed.

Expansion joints are the lungs of the copper roof. Red hot in summer and ice cold in winter, copper draws up and then goes away again. It must have an expansion joint to breathe.

Building paper should be installed under a copper roof. It acts both as a cushion and a blotting paper for moisture. On the Preachers College there was no paper. In the valleys in cold weather there was always an accumulation of frost under the copper.

No Expansion in Decks

On the decks there was not a single properly soldered seam. The original solderer had simply skimmed his iron along, thinly sealing the outer edge of the seam, instead of permitting his iron to remain long enough for the solder to penetrate the joint for a lasting bond.

On flat seam roofs there was trouble, in valleys there was trouble, but on sloping areas where standing seam construction was used, the roofs were in perfect condition.

Flashings, where they entered the wall, were pointed up with portland cement. In every eight feet out of ten this cement was cracked. Because of the amount of movement in copper it will crack



PARKER-KALON
Jiffy
REGULATOR SET

For controlling dampers in heating, ventilating, air conditioning systems.

PARKER-KALON CORP., 200 VARICK ST. NEW YORK, N. Y.

SIMPLE... LOW COST
SAVES TIME
AND LABOR

INSTALLED IN A JIFFY!


Slip on FRAME and LEVER
Turn WING NUT

SOLD ONLY THROUGH RECOGNIZED DISTRIBUTORS

A PROGRESSIVE DEALER BUILDS SALES

through use of the
GRAND RAPIDS FURNACE CLEANER

Free Trial
Convenient Terms



Write for details

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PORTABLE SHEARS
ALL-ALLOY



Two Sizes

ALL-ALLOY No. 2 cuts up to 1/4" steel plate.
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Special blades may be had for shearing stainless steel.

FULLY GUARANTEED

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Over 250,000
CONGRESS
Variable Speed
Pulleys in Use!



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Repair parts
FOR ALL
HEATING UNITS



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Distributors of All Heating and Air Conditioning Equipment
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PRESS BRAKE **HAND BENDING BRAKE**
Steel Brakes—Presses—Shears

DREIS & KRUMP MFG. CO.
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"BB" QUALITY

Order from your jobber



Saves time and labor

"BB" SPRING CIRCLE CLIP
Furnished only with "BB" Circles at no extra charge over old style straps.

BERGER BROTHERS CO.
229-237 Arch Street, Philadelphia, Pa.

the hard cement every time. The joints were cleaned out and a high grade caulking compound was installed instead.

Instead of the small, frail wire spout guards, which become quickly clogged with leaves, we built large, heavy wire guards which can become well surrounded with debris and yet permit a sufficient amount of water to drain through.

The lesson this repair job teaches is, first, that wood sheathing must be straight, smooth, seasoned, free of cracks and tightly nailed; otherwise trouble can be expected. Secondly, that good soldering and ample expansion joints are essen-

tial for a lasting installation.

Evaporative Coolers In San Antonio

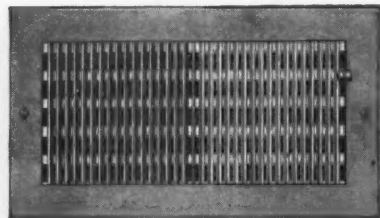
(Continued from page 57)

much increase in percentage of relative humidity, seemingly has found favor with users.

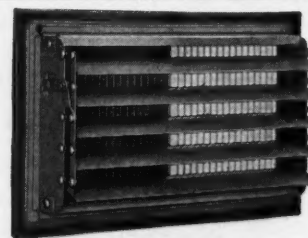
The final outcome will probably be determined during 1940. If evaporative coolers installed in 1939 continue satisfactory and if the 1939 trend continues through 1940, San Antonio may become one of the active markets for evaporative coolers.

INDEPENDENT "Fabrikated"

NO. 1521A adjustable DIRECTED AIR FLOW REGISTERS



- High quality but not high priced. Grille bars are adjustable in groups to deflect air right, left or straight outward.

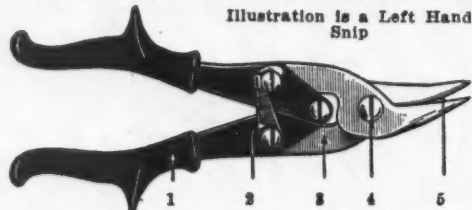


Horizontal Multiple Vanes are adjustable to direct air flows up, down or straight outward. Can be entirely closed from any position.

THE INDEPENDENT REGISTER CO.
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KLENK'S Double Action Aviation Snips

Illustration is a Left Hand Snip



1. Detachable rubber grips over handle of chrome molybdenum steel
 2. Adjustable lock
 3. Special hardened alloy steel. Tensile strength 3500 lb.
 4. A. & H. Standard bolts
 5. Curved jaws for cutting ends of tubing to .065 in. wall
- BIG VALUE—LOW COST—A trial will convince you. Made for both right and left hand—straight or curves—Easy to work—Order today.**

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SELL MORE FURNACES with this NEW LOW PRICE

Breuer's Ball Bearing

TORNADO

Furnace and Boiler Vacuum Cleaner

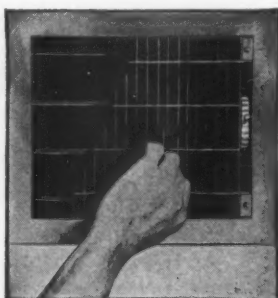


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Not only does it excel in furnace and boiler cleaning, but it puts you directly in touch with the furnace and repair needs of your customer. Not a converted household cleaner, but **DESIGNED FOR THE JOB**. Complete set of necessary attachments.

BREUER ELECTRIC MFG. CO.
5082 N. Ravenswood Ave. Chicago, Illinois

REGISTERS & GRILLES



The "Air-Con"
Finger Tip Air
Control
Double Diffusing
Registers

Can direct the air flow up or down and to the right or left. This is in addition to our extensive line of registers, perforated sheets, and ornamental grilles.

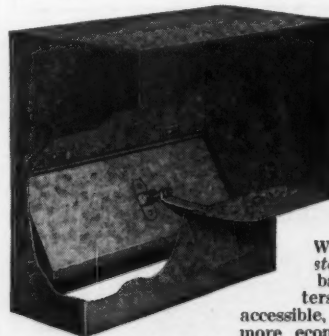
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Most Advanced Method of
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MILL EXHAUSTERS

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2. Result of over 75 years of air engineering experience.
3. High efficiency assures low power consumption.
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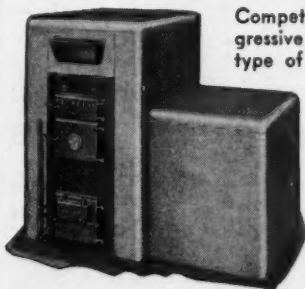
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in the

REGISTER and GRILLE
Industry coming from

REGISTER & GRILLE MFG. COMPANY
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FOR THE PEERLESS DEALER . . .**



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A LOT OF HOT AIR**

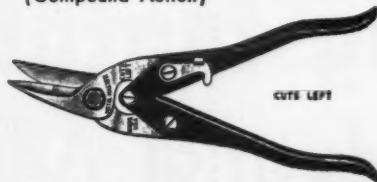
Good health and good work demand fresh air. **GLOBE** scientific design never fails to furnish it. That is why so many shops insist on **GLOBES** when they order ventilators from their local sheet metal distributor.



THE J. M. & L. A. OSBORN CO.
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GLOBE VENTILATORS
FRESH AIR PROVIDERS SINCE 1877

WISS "METAL-MASTER" SNIPS (Compound Action)



"TWICE
THE WORK
WITH HALF
THE
EFFORT"

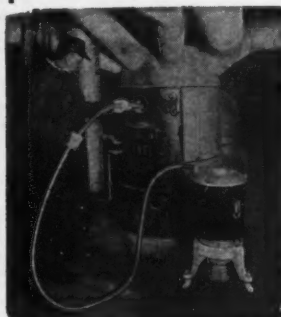
TWO MATCHED PATTERNS M1 (Cuts Left) M2 (Cuts Right) Cut circles, squares and any irregular patterns on Stainless, Dural and Monel Metals with the greatest of ease. Jaws of wear-resisting Manganese Molybdenum Steel. Handles hot-pressed from tough Chrome Vanadium Steel. Nickel steel bolts and nuts to Government specifications. All parts interchangeable. Detachable rubber handle grips at slight extra cost.

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**TAKES JUST A MOMENT
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You can save time and know whether your heating and air conditioning jobs are right when you use the "ALNOR" Velometer. Without timing or complicated mathematical calculations the Velometer gives direct, accurate, instantaneous air velocity readings. Many users report that with the Velometer they can check and balance a system in one tenth the time formerly required, and the Velometer gives them a picture of air distribution that no other instrument can. Write for details.

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WANTED—Salesmen in most all states to sell fast selling popular priced steel furnace on commission basis. Our salesmen know of this advertisement. Address Key No. 504, American Artisan, 6 N. Michigan, Chicago, Ill.

WANTED—Power Brake Operator on Metal Frames 10 Ft. Ohl Brake. Steady work. Union Shop. Address, Kalamein Doors, P.O. Box 5962, Metropolitan Branch, Los Angeles, California.

WANTED—Working Foreman thoroughly experienced in hollow metal door frames and Kalamein Doors. Union Shop. Steady Work. Address, Kalamein Doors, P.O. Box 5962, Metropolitan Branch, Los Angeles, California.

SALESMAN—Competent engineer desires steel furnaces, etc. for Southern territory. Salary or commission. Address Key No. 505, American Artisan, 6 N. Michigan, Chicago, Ill.

WANTED at once. All around sheet metal worker. Year around work for good mar. Williams Sheet Metal Works, Rockville, Md.

SITUATIONS WANTED

SALESMAN—Knows gravity, forced-air and automatic heating. Can design jobs and supervise installation. Address Key No. 506, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

FOR SALE

FOR SALE—Texas Wholesale Hardware doing profitable business. If interested Address Key 503, Amn. Artisan, 6 N. Michigan, Chicago, Ill.

FOR SALE—Complete milk can retinning plant on hand. All information and instructions necessary will be included with the purchase of this equipment. Price \$750.00. Retinning Mfg. Co., 3021-23 Greenview Ave., Chicago, Ill.

FOR SALE—Stoker Manufacturing Business including the right to new development in process, blue prints, fixtures and material on hand. Address Key No. 508, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

FOR SALE in Phoenix, Arizona, an old, statewide, known, Sheet Metal Works, with high grade equipment. Shop room 45 x 70 ft., store room 20 x 60 ft. and nice office room 12 x 18 ft. Also well equipped. Three room apartment in connection. Rent for all only \$65.00 per month. Will sell at low figure part-time to responsible party. Owner has made his stake and wishes to retire from business. If interested write Owen Sheet Metal Works, 825 E. Washington St., Phoenix, Arizona.

Will sell on account of ill health all or controlling interest in \$40,000.00 furnace and sheet metal manufacturing business located in Northwest. Established 32 years. Covers five states. Opportunity to step into going prosperous business. Address No. 509, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

FOR SALE—New and stocked Merchandise. Blowers \$14.00 up, Fan switches \$4.75, Furnace fans \$10.98, One pipe booster fans \$5.50, Stokers with controls \$88.70, Pressure gun type Oil burners with controls \$52.50, Oil burning furnaces with gun type burner and blower \$165.00, Conversion gas burners \$5.75, gravity gas furnaces with controls \$58.75, Forced air gas furnaces \$110.00, Automatic gas water heaters \$26.00, Unit Heaters steam \$50.75, air filters \$7.75, Automatic humidifier \$6.75, Gas ranges \$10.18, Electric refrigerators \$75.00. Biggs Supply, Lincoln, Neb.

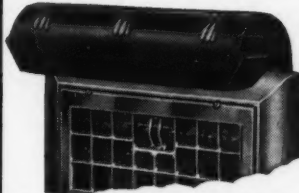
WANTED

WANTED—Used sheet metal shop equipment. Brake, squaring shear, roll, etc. Specify size, condition and price. Address, E. Florine, 3222 No. Plainfield Ave., Chicago, Ill.

WANTED—Tin and sheet metal working tools. Mail list and best prices. Address Key 507, Amn. Artisan, 6 N. Michigan, Chicago, Ill.

AGENTS WANTED

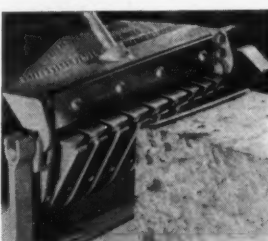
Manufacturers Agents wanted. To sell new type blower. Engineers and architects like them. Many already installed. Moves more air using less power than standard type. Easier to install. Priced lower. Address, The Gallaher Co., Owatonna, Minnesota.



**ECONOMY
and
COMFORT
with
SMALL
OUTLAY**

The **FULTON LINE** offers a line of Humidifiers for all types of heating equipment, attachable to registers or radiators, to retail for 50c to \$1.50 each. Large sale already established. Interesting literature and prices on application.

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FULTON, ILL.**



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NEWEST
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IN
SHEET
METAL
WORKING
TOOLS**

SMITH'S CLEAT BENDER

Makes uniform drive edges on pipe!
Makes drive cleats on job as needed!
No screwdriver needed to open drives!
No adjustments necessary, always ready!
Built for 20 Gauge and lighter.
Popular 12 inch Size shown above.

SAVES FROM \$10.00 to \$20.00 PER TON.

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1521 Garden Place Waukegan, Illinois**

CUSTOM FABRICATION OF ALL ALLOYS STAINLESS-MONEL-COPPER, ETC.

Custom fabrication of all alloys with satisfaction guaranteed. Send blueprints for prices and delivery. Years of experience guarantee responsible and accurate work. **TERMS CASH WITH ORDER.** Write today for further information.

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SHEET METAL PRODUCTS
1526 W. 25th St., Cleveland, O.**



Extra!

Contains complete description and listings of America's largest stock of New, Used, and Rebuilt Punch Presses, Sheet Metal Machinery, Production Machinery, and Machine Tools.

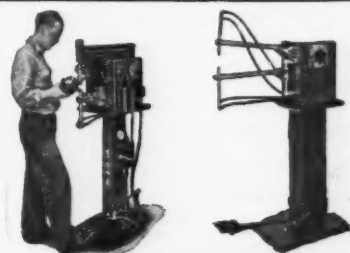
INTERSTATE'S LATEST CATALOG 404 completely indexed — full specifications. Over 200 illustrations—64 pages—handsomely printed on enameled stock—durably bound for permanent reference. Describes **OVER 2000** machines in stock ready for **IMMEDIATE SHIPMENT!**

**INTERSTATE MACHINERY CO., INC.
107 S. Clinton St., Chicago**

Tools FOR THE Roofers

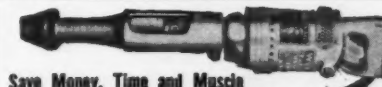
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2634 W. Madison St. Chicago, Ill.



Electric welding equipment of every description to weld from a watch case to a door. Special or standard **SPOT WELDERS** from 1/4 to 500 K.V.A. A.C. Arc Welders from 100 to 400 Amps. We invite contract Spot Welding in large or small quantities.

**EISLER ENGINEERING COMPANY
CHAS. EISLER, PRES.
761 S. 13th St. (Near Avon Ave.) Newark, N. J.**



Save Money, Time and Muscle

Drill Concrete with the "Do-All" Combination Electric Hammer and Drill. Set expansion bolts 10 to 20 times faster than with hand tools. Drills concrete, brick, stone, metal, wood. 3 tools in 1. Easy to maintain—Pays for itself. Bulletin No. 381.

**WODACK ELECTRIC TOOL CORPORATION
4644 W. Huron St., Chicago, Ill.**

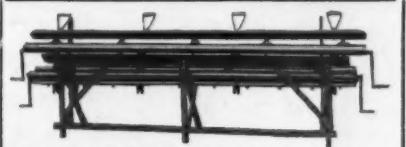
NEW SpeedWay 1/2" No. 89 DRILL

Full size, full weight, full capacity. Specially wound, high torque 115 V Universal 500 r.p.m. SpeedWay Drill Motor. Forced air cooling, oilless bearings, new natural grip breast plate and removable side handles. Streamlined die cast case. If your dealer can't supply, order direct on 10 day trial.



\$24.50
Circular Free

SpeedWay Mfg. Co., 1656 S. 52nd Ave., Cicero, Ill.



The Electric City Gutter Former

MAKE YOUR OWN GUTTER AS YOU WANT IT Easily and quickly operated. Soon pays for itself.

REPLACEMENTS

Beading Rods, Handles, Rolls, etc., quickly furnished.

STERLING BEADER

A simple and inexpensive machine for forming round bead.

F. L. ROBERTSON

56 RAND STREET BUFFALO, N. Y.

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LOOKING AHEAD

Goodwill and profits are often jeopardized by not looking ahead. A sale is not really clinched until the object sold has stood the test of time in service. This is particularly true of automatic controls.

• Considering the important responsibilities dependent upon the correct functioning of automatic controls, it follows that careful discrimination be exercised in their proper selection. • Mercoid Controls are designed and engineered in every detail of their construction and operation with but one objective—lasting dependableness. We consider this an essential characteristic in automatic controls and sincerely believe that the trade is looking for that kind of a product. • The controls presented in this advertisement, among others, are already widely known in the warm air heating field. • Years of trouble-free service have fully justified all their claims. If there be one who has not as yet made their acquaintance, it will pay now to start on the right control track. • The three controls shown herewith are respectively a Mercoid Fan or Blower Control, a Mercoid Limit Control and a Mercoid Combination Fan and Limit Control. • All of these controls have the following features in common:—they are equipped with hermetically sealed mercury switches. These switches are not affected by dust, dirt or corrosion, nor are they subject to open arcing, pitting or sticking of contacting surfaces. • Each control has a visible dial located at the center of instrument, accurately calibrated in Fahrenheit degrees, with adjustments conveniently provided around the dial for setting the desired operating range. In the combination control, the calibration is duplicated on each side of the dial for the respective fan and limit settings. Over the top of dials is located a pointer which indicates the temperature in the furnace hood. This information has proven of practical value in many instances. • Mercoid M-53 Fan or Blower Control is set to operate only when the furnace is hot enough to deliver heat—it never blows cold air into the rooms. • The Mercoid M-51 Limit Control protects automatically fired warm air furnaces from being overheated. • The Mercoid M-80 Combination Fan and Limit Control consists of two instruments combined in one case. • All three of the above controls are "built to endure." • Use them on your subsequent jobs. For further information write for catalog showing the complete Mercoid line.

THE MERCOID CORPORATION • 4207 BELMONT AVENUE • CHICAGO, ILLINOIS

SCORE YOUR OWN CHOICE OF CONTROLS

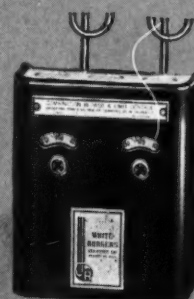
	PAR	WHITE-RODGERS	CONTROL A	CONTROL B
EASE OF SETTING Cut-in and cut-out temperatures quickly set with a twist of the screwdriver. Both clearly indicated on White-Rodgers uniformly calibrated, easy-to-read dial.	15	15 ✓		
ACCURACY OF PERFORMANCE Extreme accuracy and simplicity is accomplished by the use of the "Hydraulic-Action" sensitive element.	15	15 ✓		
MOUNTING HEADACHES GONE No time lost—no service calls from mounting inaccuracies—White-Rodgers controls operate perfectly at any angle—even upside down.	15	15 ✓		
HIGH ELECTRICAL RATING High rating of Hydraulic-Action Controls eliminates necessity of a relay on many installations.	15	15 ✓		
TROUBLE-FREE SWITCH The powerful long-life switch mechanism is built to match the great force exerted through the "Hydraulic-Action" element—result, long trouble-free usage.	14	14 ✓		
RAPID RESPONSE The "Hydraulic-Action" element is designed for quick response to rapid changes in temperature with no drift in differential.	14	14 ✓		
IMPROVED APPEARANCE Simplicity of design and flush mounting result in improved appearance of White-Rodgers Controls.	12	12 ✓		
OTHER FEATURES (Your Selection) 1. 2. 3. 4.				
TOTAL	100	100		

Rate the important features of the control you are using and see for yourself why many heating men have adopted White-Rodgers Hydraulic-Action Controls!



TYPE 513

Single-speed Fan Control. Range 100° to 300° F. Other ranges also available.



TYPE 519

Combination Fan and Safety Limit Control. Range 100° to 300° F. Other ranges available.

Add up the score! You will find that White-Rodgers uniformly-calibrated dial, positive Hydraulic-Action, higher current rating, ease of installation and many other outstanding features give you a temperature control with distinct advantages—advantages which you as a heating man cannot afford to overlook. Write today for your copy of the new White-Rodgers Condensed Heating Catalog, Under R-300, and learn what the complete line of White-Rodgers Heating Controls can do for your business!

WHITE-RODGERS ELECTRIC CO.

Controls for Refrigeration

Heating

Air Conditioning

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SAINT LOUIS, MO.

